FOUNDRY TRADE JOURNAL

EST. 1902

WITH WHICH IS INCORPORATED THE IRON AND STEEL TRADES JOURNAL

VOL. 105
No. 2189
Registered at the G.P.O. as a Newspaper

SEPTEMBER 25, 1958
Offices: John Adam House, John Adam St., London, W.C.2

Single Copy, 1/-. By Post 1/4. Annual Subscription, Home 52/-, Abroad 60/- (Prepaid)

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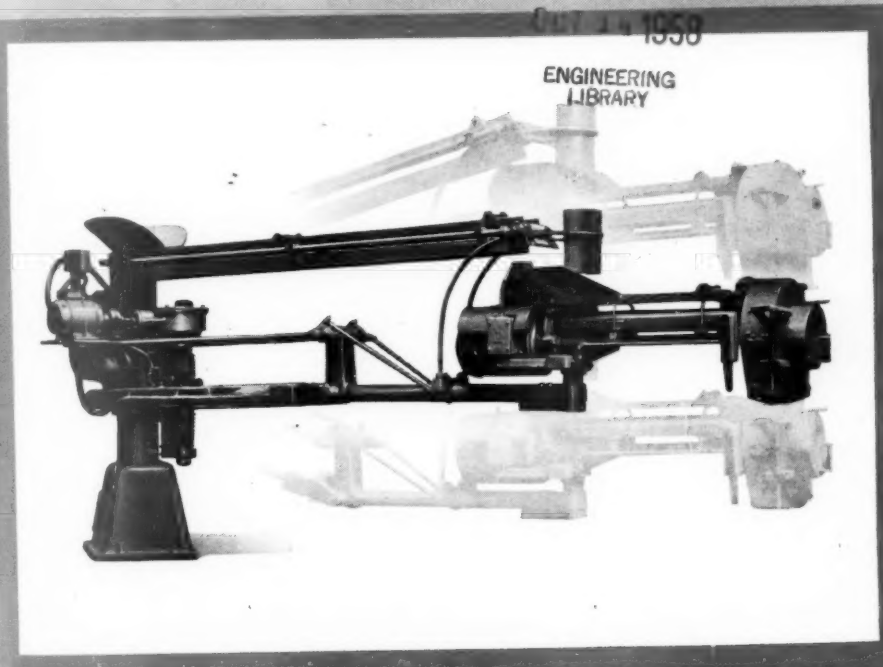

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FOUNDRY TRADE JOURNAL

Vol 105. September 25, 1958 No. 2189

Established 1902

Incorporating

IRON & STEEL TRADES JOURNAL

Single copy 1s.; *by post* 1s. 4d.

Annual subscription: home 52s., *abroad* 60s. (*prepaid*)

Editor:
V. C. FAULKNER, F.R.S.A., HON.M.I.B.F.

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Publisher: H. J. DWYER

Circulation Manager: E. T. GRIFFITHS

District Representatives: G. P. ELLIOTT (Northern Area); T. H. SMITH (Scotland)

The FOUNDRY TRADE JOURNAL is the official organ of the British Steel Founders' Association; Association of Bronze & Brass Founders; Light Metal Founders Association; Foundry Trades' Equipment & Supplies Association; and the National Society of Master Patternmakers.

AN INDUSTRIAL NEWSPAPERS PUBLICATION

Published Every Thursday by Industrial Newspapers, Limited

BARRINGTON HOOPER, C.B.E.
Chairman and Joint Managing Director

F. BARRINGTON HOOPER, B.A.
Joint Managing Director and Commercial Director

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17-19, JOHN ADAM STREET,
ADELPHI, LONDON, W.C.2

Telephone: Trafalgar 6171 (*Private Branch Exchange*)
Telegraph Address: "Zacatecas, Rand, London."

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D

modern foundry plant

for Bath Making

Photograph shows:

Six 3F size Mix-Mullers, each having a batch capacity of 4,000 lbs., fitted with dust hoods, inspection doors, and charged by batch hoppers. The charging operation and sequence for material and liquid additions, length of mixing cycle, and discharge mechanism are automatically controlled.

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FOUNDRY
TRADE JOURNAL

Vol. 105 SEPTEMBER 25, 1958 No. 2189

The 1957 Factory Report*

Mr. T. W. McCullough, the recently appointed Chief Inspector of Factories, has made a number of commendable changes in the annual Report for 1957. It has been made available several months earlier than has been the case for the last decade; he has largely separated "accidents" from "industrial health"—a report on which aspect is promised for the near future; he has cut out much verbosity and the excessive number of borderline articles which previously appeared and has cut the sale price to a reasonable figure. This new Report contains all the essentials and its main feature is the acceleration of the diminution of industrial accidents. In last year's Report covering 1956, the reduction reported was of the order of 2 per cent., whilst in 1957, the figure was over 5 per cent. for both the fatal and non-fatal accidents. The actual figures were 174,062 non-fatal and 651 fatal accidents; the corresponding figures for 1956 being 184,098 non-fatal and 687 fatal.

In 1956, there were in the foundry industry 9,338 accident cases reported of which 17 were fatal, and whilst the Report for 1957 shows that the overall figure was reduced to 8,401, the fatal accidents increased from 17 to 26. The overall figure, at 10 per cent., shows double the national average reduction, but the new figure for fatalities in this Report is distressingly high. This alone warrants increasing attention being given to accident prevention by not only managements but by everybody working in the shop. Rightly, the Report includes a chapter on safety training. Dust control is commented upon in the Report and this section will give satisfaction to that body of workers who gave up so much of the time and energy to this subject. It reads "Developments in the field of dust control have resulted from much intensive work. Dust from pedestal grinders and from swing-frame grinders has been satisfactorily controlled; new systems have been introduced for the control of dust at mechanized knock-out plants and a new method of local exhaust ventilation, known as the low-volume, high velocity system, has been applied to a large range of portable tools."

At the Press conference last week, at which the Report was introduced, Mr. McCullough stated that satisfactory progress was being made by the foundry industry in connection with the erection of bathing facilities. He was, however, not so pleased with the use that was being made of safety footwear, goggles, and protective clothing. The latter remarks, however, were not specially directed to the foundry industry. We congratulate the Chief Inspector on the new method of presenting his Report and confidently believe that as a result it will be more widely read.

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* Annual Report of the Chief Inspector of Factories for the year 1957. Published by Her Majesty's Stationery Office, York House, Kingsway, London, W.C.2; price 5s. net.

"London's Cast-iron Masterpiece"

The architectural correspondent of *The Times* has used "London's Cast-iron Masterpiece" as a heading when commenting upon the proposal to demolish the Coal Exchange in Billingsgate. This Victorian building (1847-49) has been described as the "London rival of Labrouste's Bibliothèque Nationale, in Paris"—a famous iron structure. *The Times* description of the building reads as follows:

"The circular court is surrounded by tiers of small offices reached by galleries. The dome is of a most elegant design. It has slender vertical supports of cast iron, arranged in pairs, which also carry the brackets supporting the gallery floors. The vertical lines are carried upwards in the form of curved iron ribs, forming the dome itself, each cast in one piece although they are 42-ft. long. The spaces between the ribs were originally filled with ground glass, and the eye of the dome with amber glass. Round the base of the dome, above the topmost gallery, are painted panels (not now in good condition) representing the tree-ferns from which coal deposits originated (based by the painter Sang on drawings of fossils in the British Museum), alternating with narrower panels bearing painted trophies formed of miners' tools.

"The most unusual, however, of the embellishments for which this interior is so remarkable are those applied to—or, rather, forming an integral part of—the iron structure itself. None of it is left plain. The lower supports and brackets are pierced, and the apertures are surrounded by a pattern of twisted ropes; higher up this is replaced by flat strapwork. The undersides of the galleries are also embellished with rope patterns enclosing representations of anchors and coal-balances in relief. The iron gallery railings are similarly cast in the form of loops of rope enclosing the city arms.

"The rope motif gives consistency to what otherwise might be a too-profusely ornamented interior. Though presumably chosen to symbolize the use of ropes in coalmines and colliers it is particularly suitable for casting in iron. It is this close relationship between ornamentation and technique that led Professor Hitchcock to describe the Coal Exchange as more typically Victorian than more famous edifices in cast-iron like the Crystal Palace or King's Cross Station."

Latest Foundry Statistics

Copper-base Castings. Figures issued by the British Bureau of Non-Ferrous Metals Statistics show that the bronze and brass foundries are following the same trend as the rest of industry. During the first seven months of this year 42,897 tons of copper-base castings were produced as against 45,155 tons for the corresponding period of 1957. The output for the month of July was 5,604 tons.

Ironfounding.—There were 131,061 people employed in ironfounding on August 2. Of these, states the Council of Ironfoundry Associations, 8,749 were women: at this total, there were 801 fewer than on June 28 and 6,667 fewer than a year ago.

END OF JULY WAGE RATES INDEX for workers in all British industries and services was 114—one point higher than a month earlier. The index for manufacturing industries remained unchanged at 113. Changes in wage rates reported during July resulted in an increase estimated at about £260,000 in the weekly full-time wages of about 1,238,000 people and in a decrease of £13,500 for 115,000.

Armstrong Siddeley to make American Gas Turbines in UK

An agreement has been signed whereby Armstrong Siddeley Motors, Limited, Coventry, a member of the Hawker Siddeley Group, Limited, will manufacture under licence in the UK, the range of gas-turbine engines designed and made in the US by Clark Bros. Company, a division of Dresser AG, of the US.

Clark Bros. Company is a leading American manufacturer of gas turbines and heavy compressors used in many basic industries; its models "302" and "305" gas turbines are widely used as drivers for Clark centrifugal compressors, liquid pumps, and generators, as well as in the mining, marine, and other industries. They are also used in designs for atomic energy power plants.

Armstrong Siddeley's initial programme will be to make an undisclosed number of large turbine units for major oil producers throughout the world, followed by production of gas turbines for the oil, gas, chemical, and other industries in the European, Middle, and Far Eastern areas.

The agreement, which was negotiated by Mr. H. T. Chapman, managing director of Armstrong Siddeley Motors; Mr. Douglas H. Cox, president of Dresser AG; and Mr. R. R. McCartney, vice-president in charge of the oversea operations of Clark Bros., is in line with the policy of the Hawker Siddeley Group as a whole, to broaden its industrial base.

National Society of Master Patternmakers

The National Society of Master Patternmakers has arranged for its members to visit, on October 20, the tobacco factory of W. D. & H. O. Wills at Newcastle-on-Tyne. Participants will assemble in the buffet of the Douglas Hotel, at 1.45 p.m., for commencement of the visit at 2.15 p.m. Members wishing to participate and those who will be staying overnight in Newcastle are requested to notify the secretaries, Fisher & Firkins, 12, Cherry Street, Birmingham, not later than September 27. The works visit is to be followed by a dinner and social evening at an hotel, probably at Whitley Bay, details of this will be supplied to intending participants.

Worshipful Company of Founders

Prior to a meeting of the Court of Assistants, the Master, wardens and liverymen of the Worshipful Company of Founders attended a service at St. Margaret's Church, Lothbury, on September 22. The lesson was read by the Master—the Rev. R. B. R. Walker, B.A. After the service, the liverymen and their ladies met for luncheon on H.Q.S. Wellington by permission of the Guild of Master Mariners. During this informal function, it was announced that Mr. A. A. D. Hughes, of the Old Bell Foundry, Whitechapel—a firm which has recently re-cast the famous Bow Bells—has been awarded the freedom of the Company.

The Institution of Production Engineers announce that the winners of the silver medals awarded for the best papers presented in 1956/57 by a member and a non-member of the Institution were:—Mr. J. A. GRAINGER, who wins the member's medal for his paper, "New Techniques in Sheet Metal Forming," and Mr. A. J. THOMPSON, B.SC., who wins the non-members medal for his paper, "Measuring and Forecasting Cost Data in Highly-variable Production."

What to see at NEWCASTLE

Works to be Inspected by IBF Visitors to the N-E Coast on October 10, 1958

Exterior of Victor Products (Wallsend), Limited, showing how gardens have added to the amenities of the works.

Short descriptions of the foundry and other operations of the following firms, Jarrow Metal Industries, Limited; E. Jopling & Sons, Limited; Hawthorn Leslie (Engineers), Limited; Victor Products (Wallsend), Limited; C. A. Parsons & Company, Limited; North Eastern Marine Engineering Company, Limited; Armstrong Whitworth (Metal Industries), Limited; Clarke, Chapman & Company, Limited; Noble & Lund, Limited, and Charles W. Taylor & Son, Limited, are printed in what follows. To those who will participate in the National Works Visits Day of the Institute of British Foundrymen next month, they will serve as a "curtain-raiser." Those founders who are unable to travel to Newcastle-upon-Tyne will find recorded a number of interesting contrasts with their own plant and practices.

C. A. Parsons & Company, Limited

In the latter years of last century, Sir Charles Parsons revolutionized the whole concept of power plant for electricity generation, and marine propulsion. His steam turbine, at first matching the efficiency of the reciprocating engine, and soon outstripping it, became in a relatively short time the most important prime-mover for driving generators and steamships. It is with the steam turbo-generator that the Parsons Company is chiefly concerned. Sir Charles' first machine had an output of 7½ kw.—insignificant by modern standards, but a revolutionary beginning. Though several inventors had considered the possibilities of steam turbines, only Parsons had the courage and the genius to design, construct, and successfully run a machine embodying turbine principles. He devised the idea of compounding a series of simple turbines by fitting rows of blades to a common shaft, matched by corresponding rows fitted to the inner walls of the cylinder. By allowing only slight pressure drops from row to row he exacted full energy value from the steam and cut waste to a minimum. His machines combined the impulse-and-reaction turbine principles to excellent effect. He saw the value of vacuum condensing plant, and applied it to the turbo-generator. Modern turbine auxiliaries are developed from his ideas, and the turbo-generator of to-day (Fig. 1), the product of years of research and development, has its sources in Parsons' brain.

The first Parsons works were built in 1889, on the site now largely occupied by the firm's research and design building. The site covered 2 acres, and consisted of a single workshop, 170 ft. by 50 ft., adjoined by a small patternshop, a test house, a smithy, and an office. A total staff of 48 people worked together to produce the early small machines, which were destined to do ship lighting and other minor duties. Such were the small beginnings of a company which is now among the largest manufacturers of turbo-generators in the world.

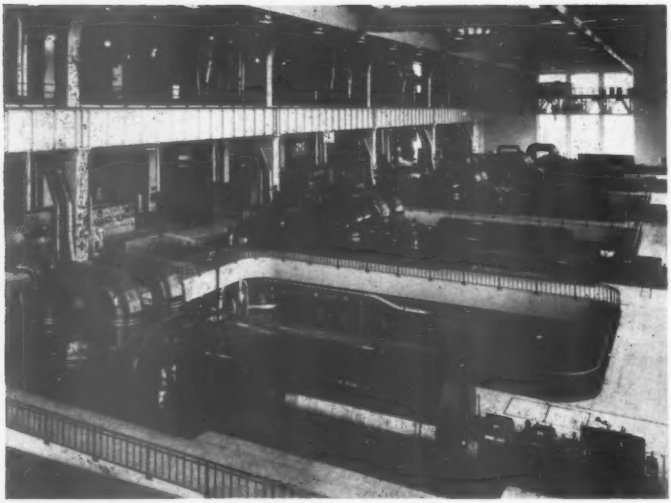


FIG. 1.—*"Stella South" power-station on Tyneside, in which five Parsons 60 Mw. turbo-generators have been installed.*

Present Set-up

Now, in 1958, a modern six-storey building on the original site houses administrative, research, and design staff. Ideal conditions exist for furthering the development of products in an industry which demands constant and rapid progress. From this building come the designs which take shape in steel on the shop floor, and govern each operation in works which now cover over 55 acres and employ 7,000 people.

A well-equipped foundry, situated in Walkergate, produces castings of many types, both heavy and light (Fig. 2). Close by it, the welding department, capable of producing the largest fabrications, contributes its share of components for the machines. The machine-shops contain machine-tools ranging from those which do small, intricate work, to large types which perform heavy boring, drilling, planing and milling operations on large turbine parts. In the blade shop, turbine blades are produced by the Parsons rolling method possessing advantages proved over the years. Condensers are constructed in another shop, whilst the pipe shop deals with a great variety of products, including ductwork and feed-water heaters. The transformer department builds units ranging from the small pole-mounted type to high-voltage units rated at 330,000 v. Parsons transformers enable the output of a large generator to be fed direct into the United Kingdom super-grid at 275,000 v. Even higher voltages are envisaged for the future.

In the erecting bays (Fig. 3) the machines are assembled for testing before being despatched to the purchaser. Increased floor-space has been provided to accommodate the enormous post-war increase in the size of machines. The 19th century output of 7½ kw. has become 550,000 kw. in the world's largest machine, which is to be built at Heaton works. Steam pressures have risen to 2,350 lb. per sq. in. in modern machines, at temperatures of 1,050 deg. F. Besides the machines of larger outputs, small turbo-generators are constructed for use by industry. Turbo-blowers for blast-furnace duties are constructed, as well as CO_2 circulators for use in nuclear power-stations (a batch of 25 turbo-generators is at present being built for nuclear generation, and many more of much higher ratings are envisaged).

The subsidiary company, Sir Howard Grubb, Parsons & Company, Limited, is world-famous for the design and construction

FIG. 2.—*Section of the light foundry in Walkergate of C. A. Parsons & Company, Limited. Note the use of chains between the rollers on the mould conveyor for traversing on to conveyors running at right-angles.*

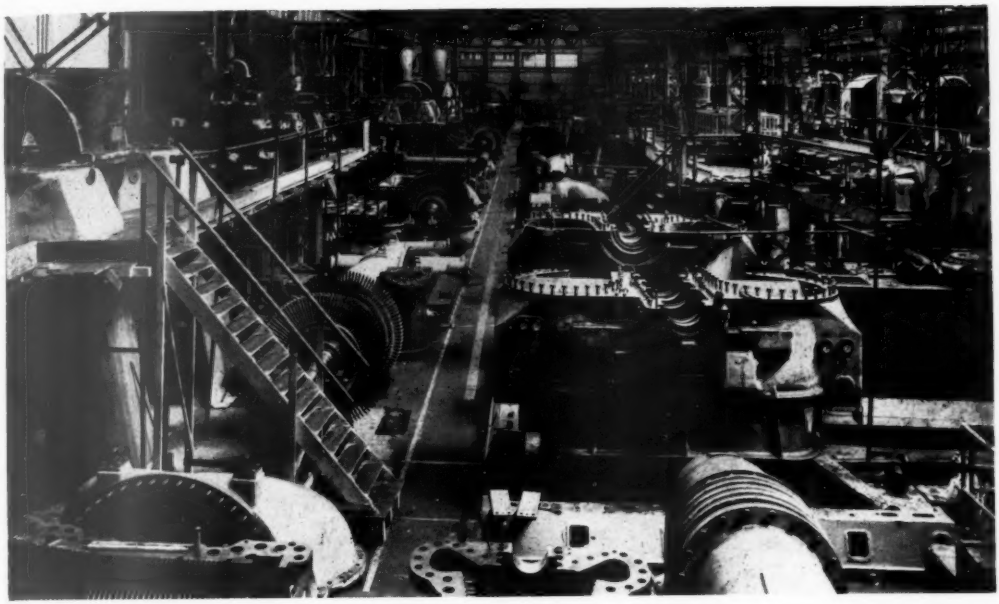


FIG. 3.—*Part of one of the erecting bays at C. A. Parsons' works, showing turbines in various stages of assembly.*

of astronomical telescopes, optical instruments and gas-analysing equipment. Close by the main works, a new nuclear research centre is being built; when completed it will be among the best equipped in Britain and probably in the world.

A school for apprentices gives a comprehensive training in the skills required in the Parsons' shops, whilst a graduate-apprentice scheme trains engineering students in the more practical aspects of the industry. Testing facilities for all the company's products are of a very high standard, and ensure the reliability of plant which leaves the works. Branches, offices and agents are situated in all parts of the world, and play their part in developing Parsons' extensive export market. As a member company of the Nuclear Power Plant Company, Limited, the company has already undertaken its share in the production of power from nuclear reaction.

E. Jopling & Sons, Limited

Joplings, of Sunderland, have been founders since the earlier half of the 19th century. When Mr. Thomas Taylorson Jopling died in 1864, Elizabeth, his widow, was 36 years of age and she successfully ran the business and brought up 13 children, until her sons were able to take over. In 1871, she founded the present firm of E. Jopling & Sons, Limited, "E," of course, was Elizabeth. Iron castings were then the order of the day, but about 1886, Mr. Ford Stafford Jopling, anticipating the increased use of steel castings, initiated their manufacture, and they later became the sole product of the works. As a commentary on the changing pattern of production, the present chairman, Mr. Thomas W. Jopling, who has been connected with the firm for 60 years, can remember cupola furnaces giving way successively to crucibles, converters, conducting-hearth electric units, to the present-day direct-arc furnaces of five-tons capacity, which feed the foundry with steels of many specifications to produce 100 tons of castings per week.

Main Divisions

Roughly 60 per cent. of the firm's output is green-sand and 40 per cent. dry-sand work. Virtually all green-sand castings are machine moulded, and some are produced from snap-flasks. The weight range is from 7 lb. to 3½ tons, and caters for all classes of engineering. An unusual feature of the green-sand work is the extensive use made of coarse silica sand, bonded with bentonite.

The coreshop is a modern building. The sand passes through a drier and is elevated to storage hoppers, from whence it is delivered, weighed, to the

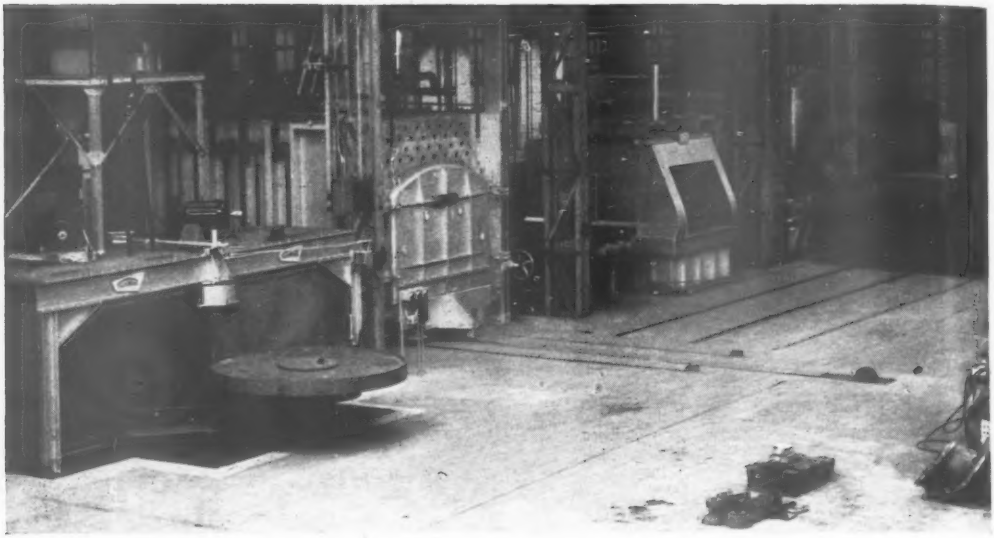


FIG. 4.—*General view of the new dressing shop of E. Jopling & Sons, Limited. On the right-hand side, a charging machine operates between two furnaces and a water quenching tank. To the left can be seen a Wheelabrator shot-blast plant incorporating swing tables.*

sand mill. The sand is then delivered by chutes to the core benches which are served by a pendulum-type conveyor leading past a vertical corestove.

There are two fettling shops, one in the older part of the works, where most of the heavier work is dressed, and a new shop (Fig. 4). The latter is a fine spacious building and deals with the light and medium castings. The shops are equipped with a shot-blast cabinet, two Wheelabrators and a twin-table shot-blast unit, and four swing-frame grinders, one of which takes a 22-in. dia. wheel. All these machines are fitted with dust collectors, which enables the dust to be wetted before removal. Hand tools are fitted with sleeve-type dust-extractors. The visitors will be able to see the considerable use of knock-off heads in the foundry.

After Treatment

Heat-treatment of castings is carried out in both oil- and gas-fired furnaces, two of the latter being served by a charging machine, which also operates in conjunction with the water quenching tank. In the newer shop, space-heating is carried out by circulation of hot water and the roof is insulated with sprayed asbestos to minimize heat losses. The partition wall between this shop and the machine shop is also insulated and in addition to a marked saving in heat, this provision makes for a pronounced reduction in the noise level.

All floors and yards are covered by concrete and this enables two dumpers and a mobile crane to operate to their fullest capacity.

The laboratories provide a check on incoming materials and exercise control over melting and heat-treatment operations. They also assist with the physical side of testing and inspection. The patternshop is well equipped for both manufacture, setting-up and repairing of patterns and, here again, all the machines are fitted with dust collectors. Part of the extensive pattern-storage area is protected by a fire-alarm and automatic-sprinkler system.

The floor of the changing room in the amenities block is heated by buried heating cable, using off-peak power, and this system provides a comfortable temperature during the day and drying facilities for wet towels and damp clothes. There are 16 showerbaths and other facilities, much used by the 300 workpeople. There is a sports and social club which caters for both indoor and outdoor games in summer and winter.

This old-established family business is a happy unit, characterized by extremely low labour-turnover and by long service from successive generations of families.

Hawthorn Leslie (Engineers), Limited

The St. Peter's Engine Works of Hawthorn Leslie (Engineers), Limited, occupy an area of some 19 acres and are situated on the north bank of the river Tyne, about one mile downstream from the bridges at Newcastle-upon-Tyne. The present site was acquired in 1870 for the purpose of extending the

marine-engineering side of the firm of R. & W. Hawthorn, who had commenced in 1817 with the building of several small sets of engines for steam packets running on the river. In 1870, the firm amalgamated with the shipbuilding firm of Andrew Leslie & Company, at Hebburn, to become R. & W. Hawthorn, Leslie & Company, Limited. At the present time, steam-turbine installations and marine oil-engines are produced at the rate of 80/90,000 shp. per annum, not only for the associated shipyard at Hebburn-on-Tyne, but for various shipbuilders at home and abroad.

The manufacture of turbine machinery by the company dates from 1909, when the destroyer, HMS Ghurka, was built and also engines for the Admiralty. With the years, the company has kept apace with the progressive development in marine turbines, particularly in machinery for warships, for which it has built installations up to the highest powers for all types of vessels. The company is a founder member of Parsons and Marine Engineering Turbine Research and Development Association and its steam-turbine machinery is built to PAMETRADA designs. Watertube boilers for these advanced steam conditions are also manufactured at the St. Peter's Works and include the "Foster Wheeler," "Babcock & Wilcox," and "Yarrow" types, with their superheaters, air-heaters and economizers. Also built by the company are condensers of all sizes for both marine and land use. Diesel machinery manufactured by the company comprises the "Doxford," "Sulzer" and "Stork" types, all operating on heavy oil or diesel oil, as required. The recent advances in supercharging are incorporated in these types of engines. Facilities are provided for exhaustive shop-tests on these engines by means of a powerful hydraulic dynamometer.

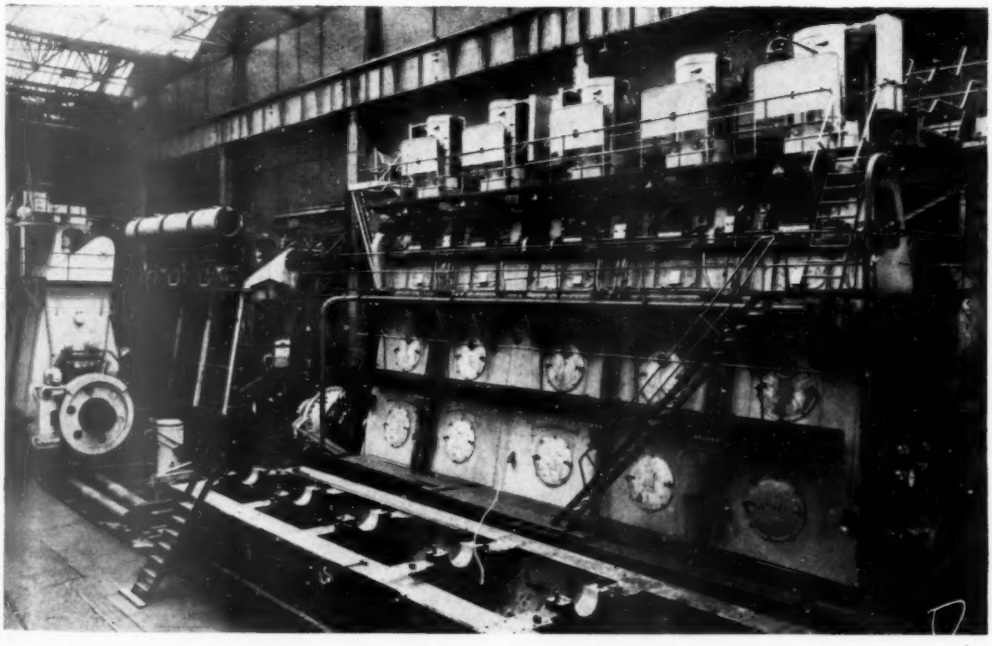
Foundry and Patternshop

The firm's foundry supplies most of the ferrous and non-ferrous castings for the engine works. It has a main bay 320-ft. long and is largely mechanized; recent equipment includes modern gas-fired crucible furnaces for non-ferrous metals. Out of a combined annual output of 1,400 tons, approximately 50 per cent. of the iron, gunmetal and aluminium castings produced are machine moulded. A controlled ventilating system and gas-fired space heating system are installed. Adjoining the foundry is the chemical and metallurgical laboratory which has a 50-ton testing machine and a cyanide-bath case-hardening plant amongst its other equipment. The spacious patternshop is well lighted and equipped with the latest types of woodworking machinery.

Boiler and Welding Shop

Equipment in the boiler and welding shop has been completely renewed recently, so as to provide

FIG. 5.—*Part of the diesel-engine shop of Hawthorn Leslie (Engineers), Limited, showing several marine engines in course of erection. (An idea of their large size can be gathered from the relative size of the ladders.)*



the most modern facilities for the construction of large fabricated-steel (welded) parts, now a feature of marine machinery, including turbine casings, gear cases, condensers, diesel-engine bedplates, entablatures, columns, etc. Provision for handling the heavy weights involved is supplied by powerful electric overhead travelling cranes. The re-equipment includes a large gas-fired stress-relieving furnace and shotblast plant.

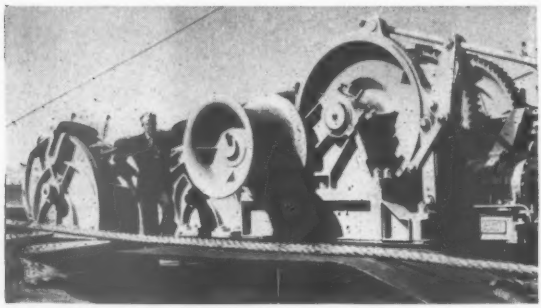
Other Departments

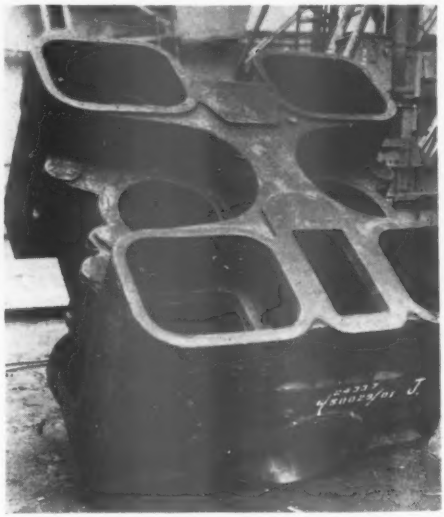
Many of the castings produced in the foundry are taken to the valve shop for machining and fitting. Large quantities of valves, etc., are produced also for other shipbuilding and engineering concerns, particularly cargo sluice-valves for oil tankers, ranging from 3- to 15-in. bore. The machine, fitting and erecting shops of the company are the subject of continuous modernization. They are served by a number of overhead travelling cranes capable of lifting up to 120 tons. Large concrete test-beds are installed in the erecting shop for the full power testing of diesel engines. Facilities are also available for the steam testing of turbines and the dynamic balancing of turbine rotors. The associated coppersmiths' shop, brass-finishers' shop and blacksmiths' shop include a range of modern hydraulic pipe-bending machines and pneumatic hammers in their equipment. The manufacture of turbine blading to a very high standard of accuracy is an important feature of modern turbine-design and, in the company's turbine-blade shop, special study has been made of the equipment and control necessary to achieve this end.

The company has now under construction and on order a large number of sets of double-reduction-geared turbines for merchant ships, including vessels of the "supertanker" class, designed to operate under advanced steam conditions up to 600 lb. per sq. in. working pressure and 950 deg. F.

Clarke, Chapman & Company, Limited

The works of Clarke, Chapman & Company, Limited, Gateshead, occupy a site of 46½ acres and 4,200 men are employed there in the production of a wide range of manufactures. The company was established in 1864 as manufacturers of ships'-deck and engine-room auxiliaries which, to-day, comprise a large proportion of the company's output and include winches, windlasses, capstans, pumps, cranes and searchlights, etc. An important part of the company's output is in the steam-generation field. Boilermakers since 1875, they now supply modern steam-generation plant for power-stations and other large industrial undertakings. This experience is now being utilized in the manufacture and erection of steam-generating units for nuclear-power projects. Clarke Chapman are members of the NPPC (Nuclear Power Plant Company, Limited) who are currently engaged on the complete erection of a 300 mw. nuclear power-station at Bradwell, Essex.





FIGS. 6 AND 7.—*Typical machinery and castings produced by Clarke, Chapman & Company, Limited, Gateshead. Fig.* 6 (*above*), *an open-type steam windlass recently installed on a* 35,000-*ton tanker; Fig.* 7 (*right*), *base casting of a large oil pump for a cargo ship.*

Foundry

The iron foundry consists of five parallel bays, running north and south, each bay being 514-ft.

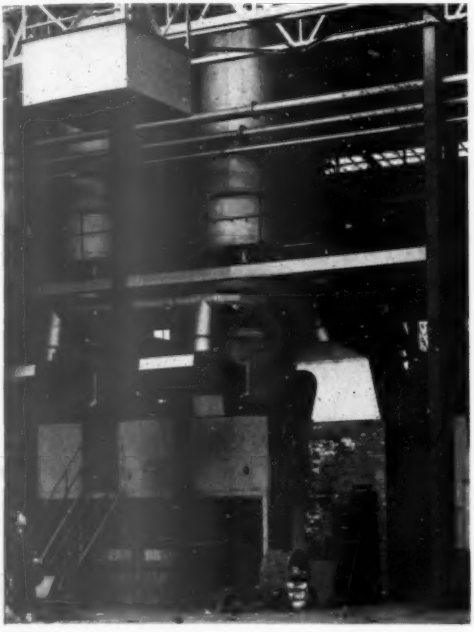


FIG. 8.—*Two new 48-in. dia. cupolas in course of construction (now in use) at Clarke, Chapman's. All the cupolas are equipped with special charging-plant of domestic design.*

long and varying in width from 25 to 35 ft. The southern halves of the bays are all devoted to heavy or floor moulding and sand preparation, as well as some of the smaller loose-pattern moulding. The northern halves of the bays are utilized for machine moulding and further loose-pattern moulding. The melting units and areas for raw-materials storage are on the western side of the foundry and the fettling and despatch of castings is on the eastern side. The foundry is ideally situated adjacent to main railway lines, which run parallel to the western side. The total area covered by the foundry is approximately 65,000 sq. ft. and a vigorous and far-seeing programme of rebuilding and modernization of buildings and plant has recently commenced, the programme being so arranged that it can be carried through without interference to production.

Types of Castings

The foundry has always specialized in the production of many varied castings, *e.g.* bedplates, sideframes, cylinders, warpends, etc., necessary in the production of deck machinery (Figs. 6 and 7). The moulding and casting of relatively complicated parts was, from the very beginning, turned into a fine art, which is difficult to improve upon, even to-day. A much greater variety of castings are now produced, however, due to developments in the design and variety of deck auxiliaries and to the extension of the range of products manufactured in the works. Castings of up to 15 tons each in weight and all grades of cast iron quoted in BS. 1452: 1956 are made, together with many of alloy types. The most recent addition to the types of iron produced is spheroidal-graphite iron, which is being used extensively on all new designs of machinery.

Melting Units

Two new 48-in. dia. cupolas have been installed (Fig. 8), having wet-type spark-arresters and dust-collectors and there are also two of 30-in. dia.; all are of the acid-lined type. Each cupola is charged by a unique unit, designed and built in the works. This consists of a bucket hoist for discharging the coke or metal charge on to a conveyor. The conveyor is synchronized to move into the charging hole of the cupola when it receives its charge, the position of the conveyor being so arranged that the charge drops centrally down the shaft, minimizing damage to lining. A recent addition to the melting plant is an electric-arc furnace with a rated capacity of 2½ tons. This unit is essentially used for the production of s-g iron from recarburized steel scrap.

Moulding

Green-sand

Some 50 per cent. (by weight) of the castings produced are cast in green-sand moulds, the majority being made on the ordinary jolt-type moulding machine, of which there are eleven in the foundry producing castings from ¼-lb. to 21-cwt. each. The numbers off any one type of casting do not allow of full mechanization and

FIG. 9.—*Pouring metal into shell moulds on the conveyor system. Note the use of air-operated automatic clamping devices (Clarke, Chapman & Company, Limited).*

production is necessarily interrupted for frequent pattern changes, but a comparatively high rate of production is nevertheless maintained. Standard steam-cylinder moulds and almost all the standard items are produced by green-sand methods on moulding machines; many of the patterns for standard castings have been made in metal, such as cast iron and aluminium for accuracy of casting. The majority of these moulds are based on the use of naturally-bonded sands of local origin. Large, bulky castings, such as warpends and barrels, are produced in synthetic sand.

Dry-sand

About half of the total tonnage of castings is made in dry-sand moulds (including bedplates), some of which are so large that they have to be split into smaller components. While adequate gas-fired stoves are available for the drying of moulds, the portable type of mould driers are extensively used for the production of relatively small but bulky castings.

Two recent advances in foundry practice, the CO_2/sodium-silicate method of producing moulds and cores, and the shell-moulding process, are used. One of the aims of the new foundry is to extend the use of these processes, and a bulk storage unit for carbon-dioxide is already installed. A special system has been devised and built by the company's design offices for the continuous production of shell-moulded castings (Fig. 9), which has increased the output of these from 200 per day to 200 per hour.

Other Departments

Modernization and mechanization of sand preparation and distribution is now taking place in the foundry. The fettling shop is able to serve directly one of the largest of the firm's machine-shops and contains a large storage-area reserved for castings only. The future programme for this shop includes the installation of noteworthy shot-blasting and ancillary equipment.

The foundry is served by a fully-equipped metallurgical laboratory, its duties covering the control of all incoming raw materials, complete checking of types of metal received and qualities of metal cast, together with complete control of the moulding sand. All pig-irons and other metals are chemically analysed and the results are used to calculate the charges which go into the melting unit and to compute any other additions. Samples of metal are taken from the melting units for chemical analysis, to check whether any variations occur and further samples are subjected to mechanical testing. Bonded loams can, of course, vary enormously in their clay content and careful checks are made on each consignment to allow for this variation during the mixing of the moulding sand. Prepared sands are tested, together with core sands, to ensure that a consistent product is always delivered to the moulders.

A recent addition to the foundry are the new baths, which, in quality, well exceed the minimum specified in the Iron and Steel Foundries Regulations.

Noble & Lund, Limited

The firm of Noble & Lund, Limited, was established by Mr. Harry Noble and Mr. Pearson Lund as machine-tool makers in Newcastle-upon-Tyne in 1886. Seven years later, in 1893, the firm moved to larger premises at Felling-on-Tyne. During the 65 years that the firm has been established at Felling, continuous progress and expansion has been made, so that at the present time the works now cover an area of 16 acres and employ 500 to 600 people.

The works comprise the following: *Modern office block* with two storeys, the upper one housing the drawing office and design department; *Patternshop,* which is 110 ft. long by 35 ft. wide, equipped with modern wood-working machines; *Pattern shed,* 110 ft. long by 35 ft. wide; and the *Iron foundry.* The latter is 330 ft. long by 54 ft. wide and is serviced by three overhead travelling cranes, each with a capacity of 25 tons, and two cupolas. Attached to the foundry is the coreshop with the usual core ovens and sand plant suitable for producing iron castings up to 25 tons individual weight.

Engineering Shops

The engineering shops of the firm are arranged under one roof and comprise: *Light erecting shop, bar store and sawing department,* which covers an area of 384 by 26 ft. This department is served by three small travelling cranes with a lifting capacity up to five tons; *Heavy machine-shop,* 384 ft. long by 54 ft., with two 25-ton overhead travelling cranes, and equipped with large planing and boring machines and two large-chuck lathes. Most of these machines are of the firm's own manufacture. *Heavy erecting shop,* 384 ft. long by 54 ft. wide, with two 25-ton overhead travelling cranes and several jib cranes. This shop is provided with large sliding doors at each end, to facilitate despatch of large machine-tools and machines can be despatched by road or rail from a private siding coming into the works. *Light machine-shop,* 150 ft. long by 42 ft. wide, served with a five-ton overhead travelling crane and equipped with capstan and turret lathes, centre lathes, and grinding machines. *Gear-cutting shop,* 70 ft. long by 42 ft. wide. This shop is equipped with all types of gear-cutting machines, gear-grinding machines, spline hobbing and grinding machines, milling machines, broaching machines, etc. *Toolroom,* 65 ft. long by 32 ft. wide, equipped with modern toolroom machines. *Store,* 69 ft. long by 32 ft. wide, with lockers and cupboards for the general engineering stores. *Brass finishing shop,* 26 ft. by 32 ft. provided with up-to-date brass-finishing lathes. *Electricians' shop,* 60 ft. by 20 ft. two-

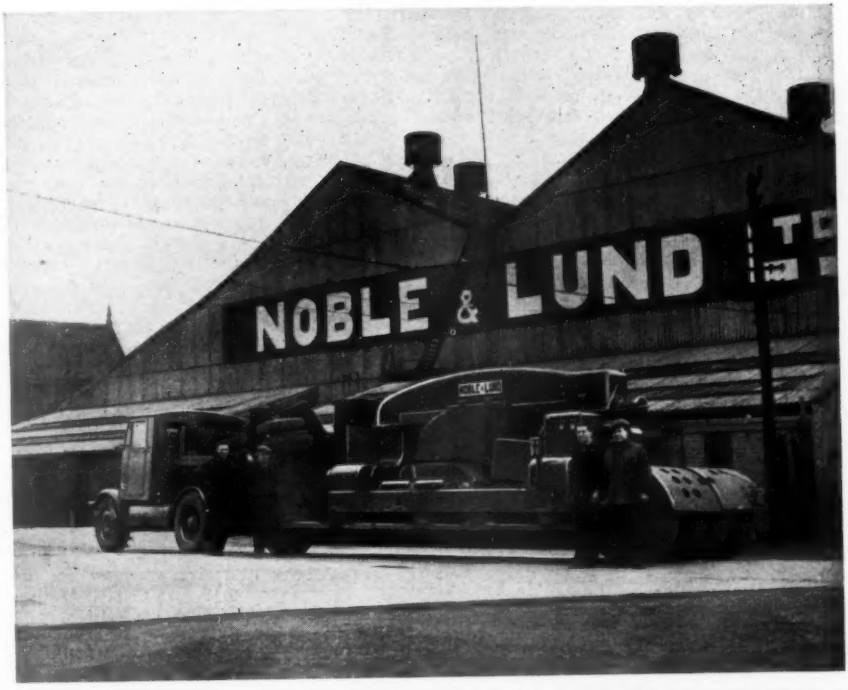


FIG. 10.—*One of the many designs of Noble & Lund heavy-duty sawing machines leaving the works at Gateshead by road transport. An indication of the large size of the machine can be gathered from comparison with the lorry and trailer.*

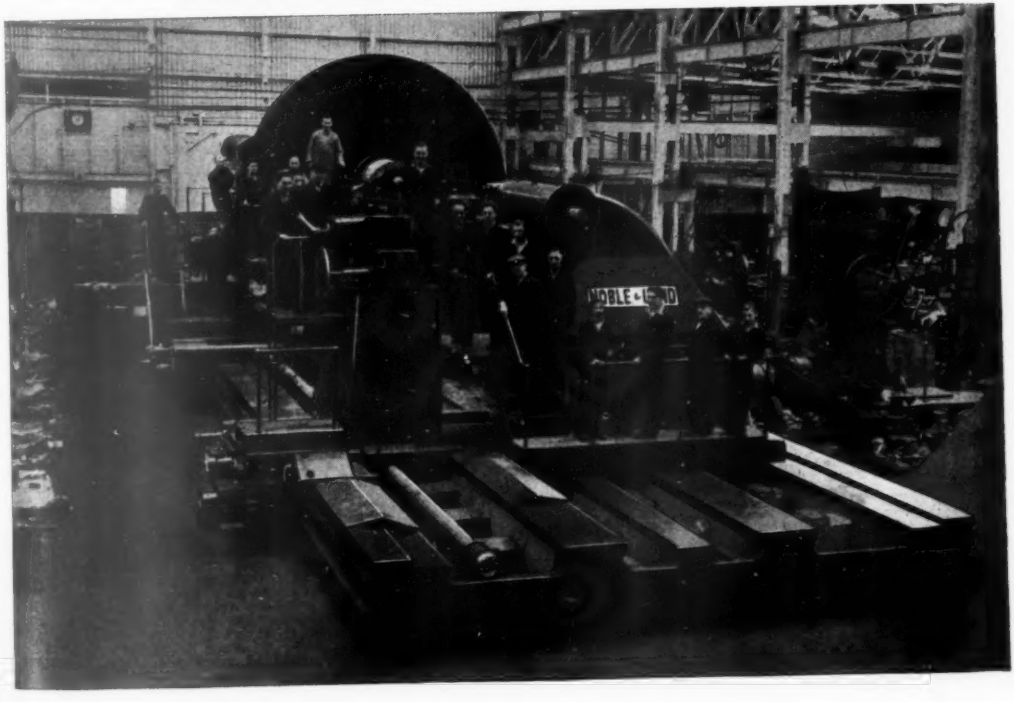


FIG. 11.—*Giant lathe supplied by Noble & Lund, Limited to Vickers-Armstrongs, Limited, at Barrow.*

storey building, with the ground floor as electricians' workshop and the first floor for store. *Boiler house* for heating the engineering shops. This is fitted with a new oil-fired boiler with automatic control. Included in an annex to the above buildings are the cloakrooms and baths; clothes lockers being provided in the changing rooms.

As an annexe to the foundry, a large building has been added and this houses ambulance and first-aid rooms, welfare officer's department, time, cost and pay office, heat-treatment department and chemical laboratory. The works has its own canteen, with kitchens and dining rooms for the workers, staff and directors.

The land not occupied by buildings is well laid out with roads and storage places for patterns, moulding boxes and steel stock. Adequate transport facilities are provided by means of a mobile crane, tractors, dumpers, etc.

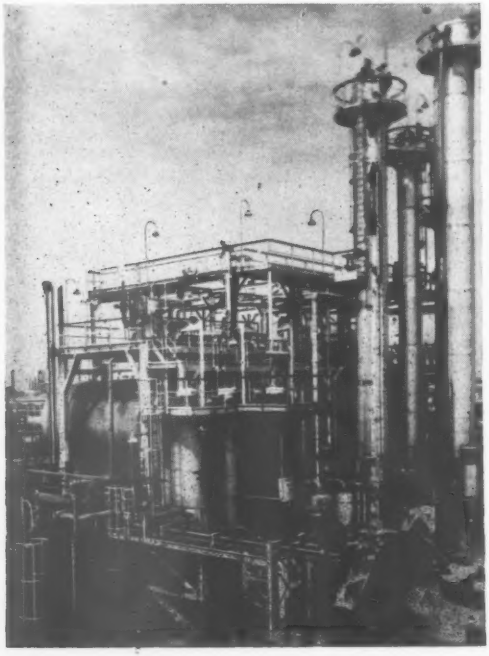
Products

The firm makes a large range of machine-tools, and these include medium and heavy-duty forge lathes, marine-shafting lathes, crankshaft lathes and chuck lathes, roll-turning lathes, break lathes and turbine rotor lathes. Also produced are railway-shop machine-tools and various types of large horizontal planing machines. Among the special large machine-tools (Figs. 10 and 11) are ingot-parting machines, plano/milling machines and turbine-boring machines. These machines are of the firm's own specialized design. In addition to the large machine-tools, the firm have a standard line of "Fluifeed" cold circular-sawing machines and, since 1930, they have built over 4,000 of these, which are to be found in almost every engineering works in the country and large numbers have been sent abroad.

Victor Products (Wallsend), Limited

In 1929, the company was promoted by two engineers, Mr. H. Crofton and Mr. R. W. Mann, to design and develop mining rotary drills. As with many companies in the early stages, much of the work involved in producing the first drills was sub-contracted, but after six years, a small factory was started. Growth was subsequently rapid and, two years later, the firm was able to borrow sufficient money from the Nuffield Development Trust with which to lay the foundations of a real factory.* In 1938, the present managing director—Mr. R. W. Mann—was appointed. Modern methods of budgetary control and a standard costing system were soon adopted, and the firm continued to progress from strength to strength.

FIG. 12.—*Part of the works of the British Hydrocarbon Chemicals, Limited, at Grangemouth, showing weatherproof/flameproof fittings produced by Victor Products (Wallsend), Limited.*



From 1939 to 1943, the company's employees numbered 147 and were at one time producing 60 per cent. of their output in direct war materials, including shell parts, equipment for the 3.7 gun and petrol pumps for the Sunderland bomber. In 1943, the company was permitted to revert largely to its own mining products, then urgently required for producing coal (indirectly also for the war purposes). At the end of the war, in 1945, the company had increased the number of employees to 268 and then turned serious attention to developing its export business. By 1953, at the height of the post-war boom, the firm employed some 500 people.

To-day the works covers an area of nearly 240,000 sq. ft. and employs 336, of whom 140 are skilled, 113 semi-skilled, and 54 unskilled.

Foundry

The foundry, in which 29 people are engaged, covers an area of 10,800 sq. ft. and castings in

* The illustration at the head of this article is of the exterior of Victor Products (Wallsend), Limited, showing how gardens have added to the amenities of the works. Factories on the North East Coast area have many of them been quite long established and had their outlook circumscribed by hard business traditions which have mitigated against much attention being given to external appearances. Nowadays, however, aesthetic aspects of factory life in the area have been much improved and many of the works compare very well with those in other parts of the country.

iron, non-ferrous and light alloys are produced from a few ounces to ¼-cwt. in weight. Green-sand moulding and shell moulding are carried out, very effective use being made of the latter process for the casting of many of the several hundred different components required. Amongst the metals handled are aluminium, gunmetal, and grey and malleable irons, and the castings weigh up to 12 lb. in aluminium and up to 20 lb. in iron. Although investigations into this process were only begun in 1953, many of the components formerly green-sand cast are now regularly produced by shell moulding.

Rotary drilling has long been one of the firm's major interests and it was, in fact, to manufacture rotary drills that the company was formed over 25 years ago. Since that time, a policy of continual development coupled with the desire to make good equipment at competitive prices has been a cornerstone of the firm's success. To-day, their products cover, in addition to rotary mining drills and equipment, drilling bits, weather- and flame-proof lighting equipment (Fig. 12), flame-proof plugs, sockets and couplers and percussive equipment, all of which are backed by a speedy spare-parts service both at home and abroad.

Amenities

In 1937, the Victor Welfare Club was started and this now covers every phase of sport and employee welfare. A canteen is also provided to meet the needs of works and staff. Also, in 1937, a systematic apprentice scheme was introduced and this incorporates both day and evening education for trainees, followed by a guaranteed future with the company. To-day, many of the supervisory personnel have passed through the firm's apprentice scheme and it is hoped that future directors of the company may be drawn from amongst them.

In 1940, a works committee and employees' suggestion scheme was introduced and over 100 accepted suggestions per annum have been adopted since its inception. The Employees' Pension Scheme came into being in 1950 and under this scheme, each employee has a retirement pension of one-half of his (or her) final salary. The scheme is contributed solely by the company out of a fixed share of profits. Each employee is protected against redundancy in times of bad trade by having an emergency fund at his disposal, amounting to approximately 10 per cent. of the employee's total earnings with the company.

Charles W. Taylor & Son, Limited

Charles W. Taylor & Son, Limited, of South Shields, was founded in 1890 as a jobbing iron foundry, manufacturing general and marine-engine castings and cast-iron propellers. The foundry commenced with one bay 42 by 240 ft. and in 1910, a second bay, 30 by 240 ft. (Fig. 13) was added. Then, at a later date, a small bay was erected at right-angles to the main building to accommodate the production of small castings in green-sand moulds.

The heavy bay is served by two 35-ton overhead electric cranes and the second, by two 12-ton cranes plus one 3-ton crane, the latter being for the use mainly of the coremakers. The small shop is equipped with a 2-ton overhead electric crane.

Melting equipment consists of three cupolas—one of 10 tons, one of 8-tons and one of 50-cwt. per hour capacity. Pig-iron, scrap, coke and limestone are brought in skip and bogie by light railway from the stockyard, which is at the end of the foundry and on the same level as the charging doors of the cupolas. Sand mixing is performed by two loam mills, one Pneulec sand mill and two Polford mills (one for oil-sand and green-sand and the other for CO_2 sand).

Sectional Layout

The stockyard consists of an open gantry carrying a 15-ton overhead electric crane at 60-ft. centres and approximately 260 ft. long. This has been erected this year and is designed so that it can be covered in at some future date if required to make a foundry extension.

There are six drying stoves, three of which are 36 by 19 by 10 ft. high, for mould drying, and three smaller ones for core-drying. These are

FIG. 13.—*General view of one of the production bays at Charles W. Taylor's foundry, South Shields.*

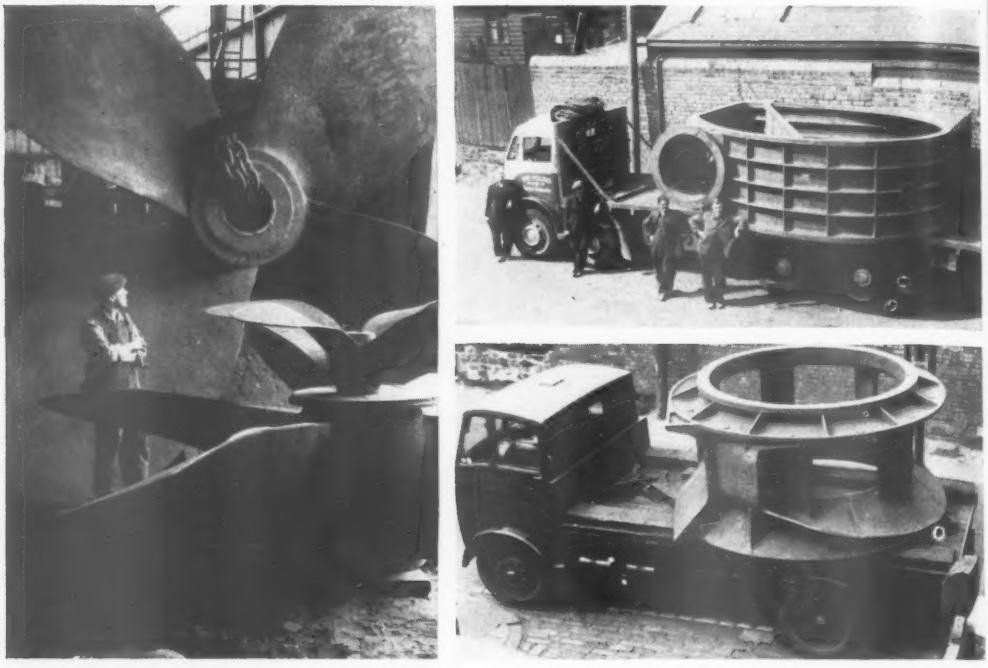


FIG. 14.—*Typical castings produced by Charles W. Taylor & Son, Limited, are shown in this composite illustration. Cast-iron propellers (made up to 24 tons in weight) and turbine casings and rotors form the basis of much of the production.*

at present being converted from coke firing to gas firing, with recirculation system. Large moulds, made in pits, are dried by portable gas-fired driers.

The total area of the works is approximately 3¾ acres, of which one acre is covered by foundry buildings, the rest being used for pattern storage and for moulding boxes, tackle, etc. The nature of the work engaged in has ranged from marine-engine—reciprocating, turbine and diesel—to general engineering castings from 1 lb. to 35 tons in weight (Fig. 14). Cast-iron propellers have been a speciality, three-, four-, and five-bladed, up to 19-ft. 8-in. dia., with the heaviest so far supplied weighing 24 tons. The output of castings over the past 20 years has averaged 3,000 tons per annum, and the total number of employees (including staff and maintenance men) approximately 180. In the amenities block, lockers are heated by hot air; 10 showerbaths are provided, along with footbaths and washbasins.

Jarrow Metal Industries, Limited

At the time of national depression in the early thirties, Jarrow had the unenviable distinction of being probably the worst of the distressed areas, mainly through the elimination of uneconomic shipyards. Sir John Jarvis, Lord Lieutenant of Surrey, was deeply moved by the deplorable situation in the town, and resolved to establish a company of steelfounders, utilizing a redundant boiler-shop in Western Road, Jarrow. The funds were provided partly by the Treasury, and partly by Sir John himself, and the new company was incorporated on October 4, 1937 as Jarrow Metal Industries, Limited. From then onwards, the works at Jarrow expanded and improved, always installing the most advanced types of melting, heat-treatment, and ancillary plant, enabling them to produce alloy-steel castings, billets, etc., up to weights of about 30 tons.

Present-day Facilities

To-day, the works is equipped as follows: melting equipment includes three basic electric-arc furnaces, one having a capacity of 15 tons and the others of 8 tons each. Approximately 350/400 tons of molten steel are produced each week, divided amongst the various products, namely cast-steel rolls, steel castings and ingots. Production is to almost any

British Standard composition for steel, including carbon-steel, creep-resisting steel, pearlitic and austenitic manganese steel, 13 per cent. chromium and 18/8 stainless steel, and high-chrome/nickel heat-resisting steel.

Cast-steel rolls of all types are produced up to 45 tons finished dressed weight for the marine- and heavy-engineering industries, and include such types as propellers, anchors, turbine and valve castings, and frames, cylinders, crossheads, rams, etc., for large press construction. Ingots are supplied in various sizes up to 15 tons in weight to almost any British Standard specification.

Foundry and Dressing-shop

The foundry is equipped with modern sand mills, sandslingers and moulding machines and with a battery of up-to-date heat-treatment stoves, pyrometically controlled and with capacities of up to 25 ft. long, 8 ft. 6 in. wide and 6 ft. high.

The cleaning of castings is effected by the use of a Hydroblast plant having a gunroom 22 ft. by 18 ft. and a water pressure of 2,300 lb. per sq. in. There is also a metallic shot-blast plant with a chamber capacity of 15 ft. by 12 ft. by 7 ft. 6 in. high, and more recently, a two-table (6-ft. dia. each) Wheelabrator has been installed, as well as modern types of chipping hammers, grinders, Lindé burners and air/carbon-arc burners.

Other Departments

A pickling plant, having a bath dimension of 12 ft. by 8 ft. by 6 ft. deep using hydrochloric acid and a hot neutralizing bath of similar dimensions can cater for all inspecting authorities' requirements.

The laboratories, which have recently undergone extensive improvements, are equipped with modern equipment for rapid and accurate chemical analysis, and for the determination of the physical properties of magnetic materials. The metallography department is equipped with a modern microscope which enables photomicrographs at high power to be obtained under dark-field and polarized-light conditions.

The inspection department is equipped with all forms of non-destructive testing methods, including gamma-radiography using a powerful Cobalt 60 isotope, two kinds of electro-magnetic crack-detectors, and the latest model of ultrasonic crack-detecting apparatus.

There are at present about 420 workers and 80 staff on the payroll of the Jarrow works.

North Eastern Marine Engineering Company, Limited

The North Eastern Marine Engineering Company, Limited, a member of the Richardsons Westgarth Group of Companies, has its works situated on the north bank of the River Tyne at Wallsend. These works cover an area of 33 acres and are well equipped with modern machinery. At the present time, extensive alterations are being carried out which have necessitated the re-siting of some of the main shops and the iron foundry, and this has involved the removal of the heavy and bulky foundry equipment from buildings in another part of the factory—a task which was completed without interruption to the production programme.

The company was founded in 1865 and since that time has been engaged in the construction and installation of all classes of propelling machinery for both naval and merchant vessels of many nations. The products of the company include, amongst others, the patented "North Eastern Reheat" steam engine, which represents a considerable improvement on the orthodox triple-expansion engine. In connection with this engine, the "Nemenco" combustion chamber superheater was designed and patented and the temperature of steam employed in triple-expansion engines was increased. Approximately 2,100 people are em-

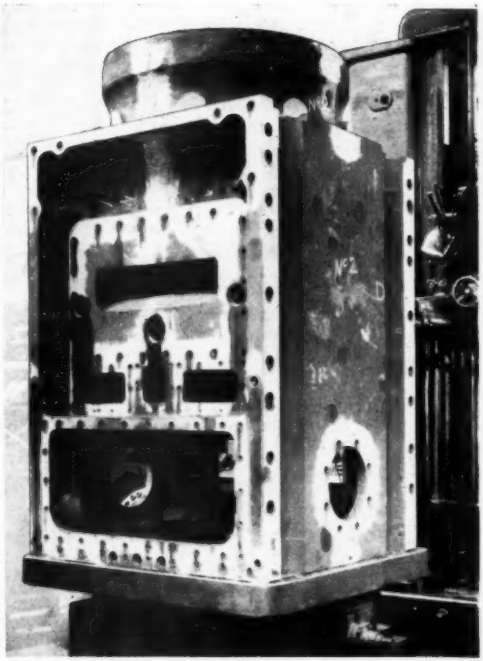


FIG. 15.—*Vertically-cast cylinder-block for a Clarke: Sulzer marine oil-engine, produced by North Eastern Marine Engineering Company, Limited. The block weighs nine tons and stands eight feet high.*

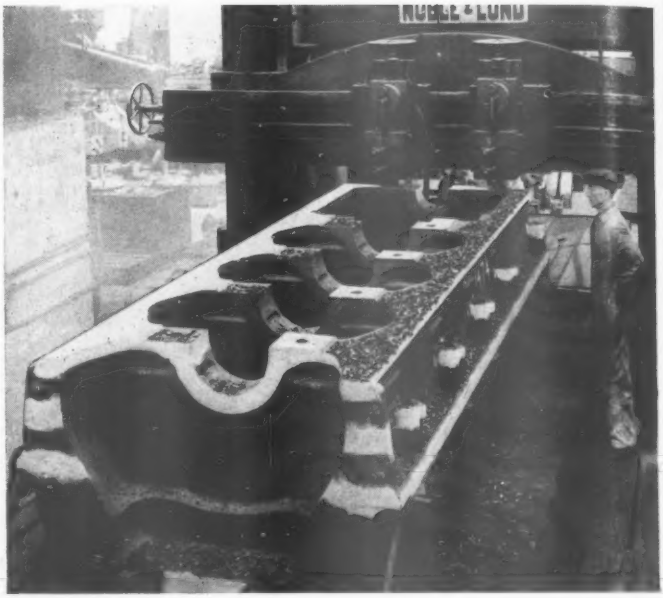


FIG. 16.—*Bedplate casting for Clarke : Sulzer marine oil-engine being machined at the Wallsend-on-Tyne works. Horizontally cast, it is* 13 *ft.* 6 *in. long and weighs* 6 *tons* 13 *cwt.* (*North Eastern Marine Engineering Company, Limited.*)

ployed at the Wallsend works, in all the various aspects connected with the manufacture of the complex machinery required to meet the demands of shipowners for faster and more economical ships.

Iron Foundry

The iron foundry (which has recently been reorganized into one block) is of the jobbing variety and produces high-duty castings for numerous outside customers in addition to those required for the firm's own engine and boiler shops, where Doxford oil-engines, "Scotch" and water-tube boilers, and all the many ancillary units required for a modern ship's propelling machinery are produced. In addition, castings are also produced here for the other works in the group and include those for Clarke : Sulzer oil-engines (Figs. 15 and 16), steam- and gas-turbines and numerous other items. The foundry covers an area of about 25,000 sq. ft. and employs some 150 men, of whom about two-thirds are fully skilled tradesmen. It is capable of handling castings up to 20 tons in weight, the iron for these being prepared in acid-lined cold-blast cupolas.

At the present time, the company is engaged in the construction of large marine oil-engines and the first Doxford supercharged engine, developing 8,000 b.h.p., was recently put into service, whilst in the boiler shops, work is in hand on the construction of large "Scotch" and water-tube boilers and on evaporating plant (of Richardsons, Westgarth design) for producing fresh water from the sea on a scale large enough to provide drinking water for a sizeable township.

Amenities

The social side of the employees' life has not been overlooked by the company, and full canteen facilities are provided, whilst, for leisure hours, the cricket and football teams have full fixtures with teams from other works in the district. Badminton, bowls and motoring clubs have also their strong supporters. Facilities for all these activities are provided within easy reach of the works and a large sports field has just been laid out and will be ready for use next year.

Armstrong Whitworth (Metal Industries) Limited

The name of Armstrong Whitworth is an old and famous one, and it should be remembered that the origin and development of the great engineering firm took place on Tyneside as long ago as 1847. At that time, its conception and early progress was due almost entirely to the efforts of one man, W. G. Armstrong, a man with an intense interest in all mechanical components. He opened his engineering works at the village of Elswick, employing about 20 or 30 men, his products being hydraulic machinery, cranes, and later—during the Crimean War years—mobile artillery. Armstrong was knighted in 1859, and in 1897, saw the amalgamation of his firm with Joseph Whitworth, thus his company became—Sir W. G. Armstrong Whitworth & Company Limited. His company expanded greatly, and the number of employees reached about 25,000.

In 1928, came the amalgamation with Vickers Limited, and the foundry for the Elswick works was transferred to Close Works, Gateshead. Since then, and up to the present day, Close Works has been the home of this great company. Nowadays, Armstrong Whitworth (Metal Industries) Limited, as the company is known, is very well equipped. For easy appreciation, the works can be divided into three parts: (1) the roll foundry and machine shop; (2) the iron foundry and refined-iron department, and (3) the engineering department.

Roll Foundry and Roll Machine-shop

All types of cast-iron rolls are manufactured in

this department, of from 55 to 90 Shore hardness, and up to 20 tons cast weight. Steel-base rolls, with from 1.2 to 2.2 per cent. carbon and up to 30 tons cast weight, and steel rolls up to 30 tons in cast weight are also produced.

The foundry is equipped with four air-furnaces typical of those used in the rollmaking trade, of capacities of up to 18 tons. For annealing, there are two pit-type town's-gas-fired furnaces 18 ft. long, two bogie-type furnaces, also gas-fired, 20 ft. long. This latter furnace will be of special interest to the visitors because of its size—being the largest erected in this country.

The roll machine-shop is equipped with heavy-duty lathes, etc., to handle cast rolls from a few pounds in weight up to 60 tons. Another item of special interest is the rough grinder.

Iron Foundry

The iron foundry at Close Works is equipped with two cupolas of 8 tons per hour capacity each, one of 3 tons per hour, and one basic electric-arc unit of 3 tons capacity.

Castings manufactured vary in weight from a few pounds to 20 tons, and in composition range from ordinary cast iron to high-duty irons conforming to British Standard 1452 in its various grades, and in s.-g. iron (to B.S. 2789). The company manufactures s.-g. iron with both Admiralty and Lloyd's approval.

Closely linked with the iron foundry is a refined-iron department, which produces numerous grades of iron to specified analyses, in the form of chill-cast pigs of about 30-lb. individual weight.

Serving both the roll foundry, iron foundry and refined-iron department (and, on occasions the engineering department) is a fully-equipped metallurgical department, which includes provision for laboratory testing—chemical, metallographical, non-destructive and ultrasonic—along with determination of mechanical properties.

The overall production of molten metal handled within the three foundry departments of the organization is between 500/600 tons per week.

Engineering Department

The principal products manufactured in the firm's engineering department are " Oilwell " drilling and production equipment, Kue-Ken jaw and gyratory crushers, and power-transmission equipment; in addition, capacity is available for machine building and sub-contract work in a large variety.

THE WORLD BANK has approved a loan equivalent to $85,000,000 to India to help meet the foreign exchange costs of a programme to improve and expand the Indian state-owned railways, an important part of India's second five-year plan. Since 1957, when the bank lent India the equivalent of $90,000,000 for the railways, the programme has been revised to provide for an increase in freight-carrying capacity from 114,000,000 tons annually, to 168,000,000 tons, instead of the 162,000,000 tons originally planned. This will require the purchase of 11,000 additional freight cars over the 107,000 previously estimated.

Dollar Import Restrictions Relaxed

Relaxation of restrictions on dollar imports into Britain, involving an almost clean sweep of controls on dollar imports of industrial, agricultural, and office machinery, and leaving only a limited range of comparatively specialized machinery under restriction, was announced by Sir David Eccles, President of the Board of Trade, at the Commonwealth Trade and Economic Conference in Montreal last week. The relaxations would come into force immediately and, said Sir David, the stage would have been reached when nearly all materials, basic foodstuffs, and " tools of trade " would be free.

A spokesman of the Federation of British Industries said that the news was welcome as industry had found it difficult from time to time to satisfy its requirements in particular classes of machinery which could be obtained only from the dollar countries. It would also contribute much to the furtherance of the liberalization of international trade.

A similar attitude was expressed by the National Union of Manufacturers. There were many imports that could be better obtained from the dollar area than elsewhere, particularly machine tools, it was said. Manufacturers had perpetually been up against dollar controls and any general relaxation must be a good thing and have a real effect on expansion and improvement of productivity. Corresponding relaxations were hoped for from the other side of the Atlantic, particularly the US.

Lead and Zinc Production in OEEC Countries

Pig-lead (minimum content 99.95 per cent.) production in OEEC producer countries (Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, the United Kingdom, and Sweden, as well as in Morocco and Tunisia) amounted to 40,092 *tonnes* in July, as compared with 48,291 *tonnes* in June. As compared with July, 1957, there was a decrease of about 7 per cent. in the level of production.

Refined zinc production for OEEC producer countries (Austria, Belgium and the Belgian Congo, France, Germany, Italy, the Netherlands, Norway, and the United Kingdom) amounted to 68,074 *tonnes* in July, against 68,284 *tonnes* in June. There was no change in the level of production compared with July, 1957. The July, 1958, breakdown into qualities was:—High-grade and special high-grade zinc (at least 99.95 per cent. zinc content), 28,546 *tonnes*; others (g.o.b., debased), 39,528 *tonnes*.

Westinghouse Sets Up European Atomic Subsidiary

To serve the nuclear power needs of Euratom and other European countries Westinghouse Electric International Company has established a subsidiary in Geneva, to be known as Westinghouse International Atomic Power Company. The new firm will be the centre for mobilization of all resources of Westinghouse and its European associations in the service of the Euratom area.

Manufacturing and technical assistance agreements with three leading manufacturing concerns—Ateliers de Constructions Electriques de Charleroi of Belgium, Fiat of Italy, and Siemens of West Germany—have already been concluded. A similar agreement is being worked out with French interests.

Coventry Climax Engines forming New Export Company

A new company to promote the export sales of all the group's products is being formed by Coventry Climax Engines, Limited. Chairman of the company will be Mr. Leonard P. Lee, chairman and managing director of Coventry Climax Engines. Other members of the board of the new company will be Mr. J. Peter Ford, managing director, Mr. Hugo W. M. Fleury, and Mr. Percy W. Cooper. Mr. Ford has resigned his position as group sales director of Associated British Engineering, Limited, to take up his new appointment.

Products of the Coventry Climax Engines group include fork-lift trucks, fire pumps, diesel and petrol engines, generating sets, and outboard marine motors. The new company will be based on the present Coventry Climax Engines London offices and showrooms at 163, Piccadilly, W.1.

Following the death of Mr. J. M. Morris, Coventry Climax Engines has reorganized its sales department, and announces the appointment of Mr. Bernard A. Christie as home sales manager of all products. Mr. Christie is a director of Coventry Climax (Electrics), Limited, a subsidiary of Coventry Climax Engines.

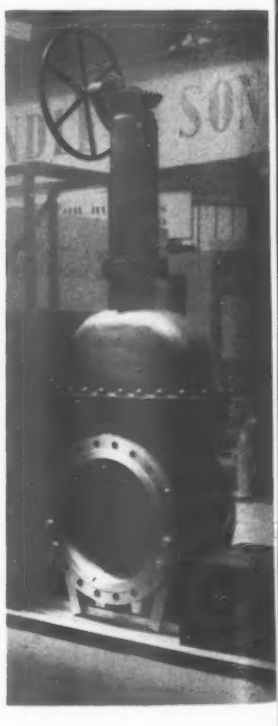
"Cutlers' Feast" for English Steel Staff

Last week the first of two dinners for the staff of the English Steel Corporation, Limited, was held in the Cutlers' Hall, Sheffield. The host was the Master Cutler and chairman of English Steel, Sir Frederick Pickworth. The main reason for the dinner, he said, was that it was the first time for 38 years that a Master Cutler from what was now known as ESC had given a dinner to his staff. Another reason was that the Mistress Cutler and he had spent the whole of their lives in Sheffield and he had spent most of it as "one of you."

Four hundred members of the supervisory and other staff of the firm were the guests last week at what Sir Frederick said was as near as possible a dinner according to the Cutlers' Feast traditions. This week English Steel men from "the shop floor" will be entertained, the two events being among the last to be held in Sir Frederick's year of office as Master Cutler.

Thanking their host, Mr. H. Hoyland, a former chief clerk of English Steel, paid tribute to the goodwill that Sir Frederick had created at ESC between management, staff, and workpeople. They owed a deep debt of gratitude to him for his farsightedness, able leadership, and consideration, he said.

Notable Stainless-steel Castings



Illustrated above are two castings, made by Firth-Vickers Stainless Steels, Limited, Sheffield, claimed to be the largest ever produced in stainless steel. They are a 24-*in. bore valve-body, weight* 1,370 *lb.; and cover* (570 *lb.) Made to the order of Joshua Hindle & Sons, Limited, Leeds, in Staybrite FCB/FB steel, at Firth-Vickers' Blackheath foundry, Birmingham, they are destined for use in the chemical industry. In the right-hand illustration they are shown fully assembled, as displayed on Hindle's stand at the recent Chemical and Petroleum Exhibition.*

Catton's increase Productivity . . . .

. . . . by Improved Mechanical Handling

Britain's steelfounders continually strive for more-efficient working methods and production techniques to achieve greater output. Advances in steelmaking, moulding, fettling and heat-treatment methods have all increased output, but equally important has been the introduction of better materials-handling techniques. At the Leeds foundry of Catton and Company, Limited, for every ton of finished castings leaving the foundry, 100 tons of raw materials and production accessories have to be moved. Recently, the firm investigated their handling methods throughout the manufacturing cycle, and what follows is an account of some of the changes introduced.

The first step in Catton's productivity drive was to speed up the transport of molten steel from the two Birlec electric-arc melting furnaces to the moulding shops. At about hourly intervals, molten steel is poured from the furnaces into a ladle which, when full, weighs nearly seven tons. This ladle has to be moved as quickly as possible down aisles to be picked up by the overhead cranes in the moulding shops, where the metal is poured. Until recently, petrol-driven platform-trucks and bogies were used to carry the ladle, but the trucks were too wide to turn round in the 9-ft. wide aisles and so had to make the return journey of some 300 yards in

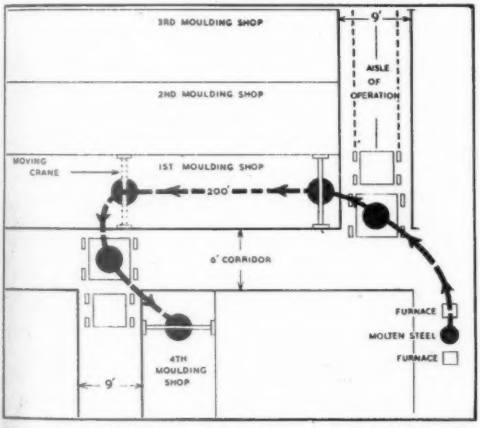


FIG. 1.—*Diagram showing the ladle route in Catton's foundry.*

reverse. This manœuvre wasted time and the process was further complicated because it was impossible to transport the ladle along the aisle to the fourth moulding shop (see Fig. 1). To provide metal in this shop, one truck hauled the ladle 60 ft. from the furnace to the overhead crane in the first moulding shop, and from here the ladle was carried by the crane 200 ft. and loaded on to a second bogie/truck combination and taken to the moulds.

The costs of handling liquid steel this way were considerable; working a 24-hr. day, Catton's employed a special truck-driver for each twelve-hour shift. Then there was often the " bottleneck " of trucks and bogies remaining stationary in two of the foundry's most important aisles, awaiting the return of ladles from the moulding shops. Such obstruction caused inconvenience to other traffic and delayed deliveries of patterns, cores and other materials.

Flexible System

The need was to find a tractor powerful enough to pull the ten-ton bogie, yet small enough to turn round in the aisles for a quick journey back to the furnaces. Following a demonstration, a choice was made of a Worksaver* tractor (length 47½ in., width 31¼ in.) for this purpose (Fig. 2). With this one tractor, delivery of steel to all the moulding shops has been accelerated. First towing the bogie to the moulding shop, the ladle is off-loaded, and the tractor then travels to the other end of the bogie; the drawbar is reversed, and tractor and trailer set off to move other materials about the works before collecting the empty ladle and returning it to the furnaces. Easy control of the tractor, which is battery powered, ensures safe conveyance of the molten metal; only one ladleman is employed to drive it and he moves his own steel as required. The other drivers have been more beneficially employed elsewhere in the foundry.

In the first year of operation of the new system, Catton's claim to have made a saving in capital investment, running costs and wages of approximately £1,720—and have increased the production of castings. Electric power for the truck is quoted as costing only 3s. 8d. per month.

Furnace Charger

Less manual fatigue, reduced treatment time and greater overall efficiency are also claimed to result from the adoption of a similar type of truck and ancillary equipment for handling small, intricate castings in Catton's heat-treatment department. Until quite recently, the heat-treatment furnaces in the dressing shop which were set aside for small

* A model produced by Yale & Towne Manufacturing Company, Wednesfield, Staffs.

Catton's increase Productivity

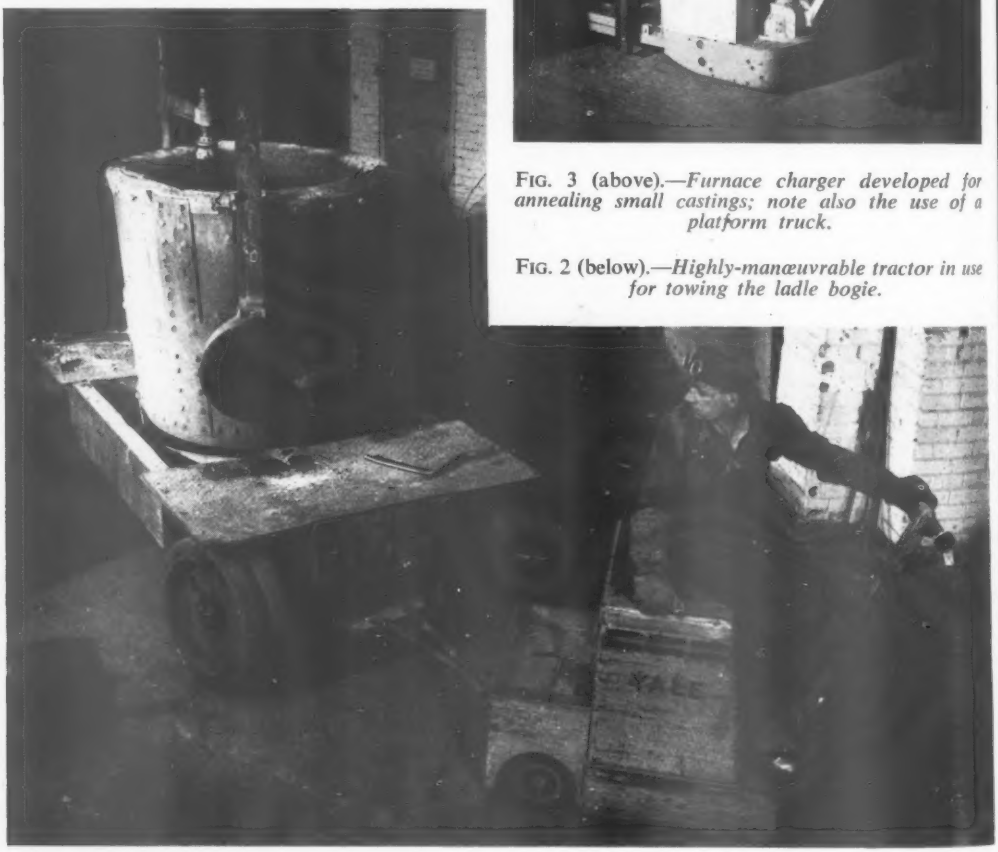
castings, had to be unloaded and charged manually —a lengthy operation taking 1½ hours. It was also expensive because during the loading period, the furnace temperatures would fall to 300 deg. C. All told, the heat-treatment cycle covered 14 hours.

To accelerate the process, Catton's designed a furnace charger (Fig. 3), which consists of a steel frame, counterweighted at the rear and with prongs at the front. Underclearance permitted it to be lifted by the platform truck. The brick floor of the furnace was recessed to take the charger prongs and the truck now delivers castings right into the furnace—lowering of the platform leaving the castings resting on the firebrick hearth. Truck and charger are then withdrawn. Hot castings are removed by a reversal of this procedure.

This new method of clearing and charging a furnace takes but five minutes, during which time the furnace temperature only drops to 600 deg. C. Thus quicker handling has reduced heat losses, cut power consumption and reduced furnace operational time. The whole of the heat-treatment cycle is now 6½ hours, and treatment capacity, and, hence, the productivity of the shop, have shown considerable increases along with a lessening of manual fatigue among the operators.

FIG. 3 (above).—*Furnace charger developed for annealing small castings; note also the use of a platform truck.*

FIG. 2 (below).—*Highly-manœuvrable tractor in use for towing the ladle bogie.*



Protective Clothing and the Law

By W. H. D. Winder, LL.M.

When personal injuries occur in a foundry through failure to wear the available protective clothing, the question of legal liability as between the employer and the employee who is injured is not an easy one to answer. However, a recent decision of the Court of Appeal has clarified the position. In this important case, known as Haynes *v* Qualcast (Wolverhampton), Limited, an experienced moulder who was splashed with molten metal was partly successful in his action for damages even though he knew that the protective clothing was available for his use but did not use it.

He was a man of 38 and had been in the trade all his life. He was employed in the defendant company's foundry as a moulder and while handling a ladle of molten metal the handle slipped and the metal splashed on to his foot and ankle with the result that he suffered injuries. At the time of the accident, he was not wearing protective spats which would have saved his foot and legs from hurt. The company kept a stock of spats on the premises and they could be had for the asking. In addition, the company kept a stock of protective boots which they supplied to their workmen at cost price. The plaintiff knew that spats and boots were available, but he had not been ordered, or indeed advised, by the company to wear spats. He well knew the dangers which beset the operation that he had to carry out. Indeed, he himself made provision to meet them by wearing strong working boots which he bought himself.

In these circumstances, it would not have been surprising to find that the company was not liable to pay damages to him in respect of his injuries. It was held, however, that the company was negligent and was 25 per cent. to blame for the accident, the plaintiff himself being 75 per cent. to blame. One judge in the Court of Appeal only reluctantly decided that he was not 100 per cent. to blame, because it was "an extreme case and one where the workman might have been held, from any general point of view, responsible for his own injuries—he could so easily have prevented them by taking those precautions of which he knew and which he knew some of his colleagues were taking."

Employer's Obligation to Inform and Educate

The reason why the company was under a liability to pay damages was this. The legal precedents show that in dangerous work done for an employer there is a duty on the employers not only to have protective clothing available but to inform anyone coming into their employment that the equipment is available and, further, to take steps to educate the employee to wear the equipment for his own safety. The obligation on the employers extends to more than merely having the equipment available in case any experienced worker would like to use it. It is difficult to define the exact extent of the duty to warn or advise about the safety equipment. It depends so much on the facts of each case. In the recent case, the court did not think that, having regard to the nature of the hazard, there was a duty imposed on the company to go to very considerable lengths to see that their workmen did take advantage of the protective equipment supplied. But they did nothing at all, other than have the clothing ready for those that asked; there was therefore a breach of duty.

The damages were not heavy, as claims for industrial injuries go; the total damages amounted to £233. The decision meant that the plaintiff was awarded only a quarter of this sum (£58 5*s*.) as he was held to be 75 per cent. to blame. The significance of the case does not depend on the monetary liability involved. That is no doubt why the company appealed to the Court of Appeal from the decision of the county court in which the action was originally brought. The principle involved was whether the company should be liable at all. The Court of Appeal agreed with the county court that there was liability to the extent stated, thus there is now a fully-reported legal precedent for the guidance of other employers and other workers.

Stubborn Cases

The judges showed themselves as appreciative of the point that "if an employer tries too much to assume the function of a matron or grandmother it may be far from good for the safety of the workman." And the counsel for the plaintiff said that he would be the last to suggest that in the interests of safety all responsibilities, so far as was possible, should be removed from the men themselves. There was a suggestion in the evidence that the plaintiff was a person of the type who knows better than everybody else. The Court of Appeal said that if it had been true to say that, according to the fair balance of probabilities, nothing really would have persuaded the man to take proper steps for his own protection, then, of course, the employers would not have been liable at all.

Another useful indication of the extent of the employer's duty with respect to protective clothing and safety equipment was given by the Court. It was said that in some cases the danger may be so great, and the injury, if it occurred, so serious, that it might be necessary to make the wearing of the clothing and the use of the equipment a rule of the factory. It was not considered to be necessary in the foundry in question in relation to the particular operations involved. Nor was this recent case concerned with the scope and effect of statutory Regulations. When these apply, additional legal considerations arise in an action for damages.

Year of Development for James Howden & Company

The order-book of James Howden & Company, Limited, marine and general engineers, of Glasgow, was larger at the end of the 1957-58 year than at the end of any previous year. Output also exceeded that of the previous year. Mr. C. W. Hume, chairman, describes these as "very satisfactory indications."

In his report he points out that the £231,268 decrease in the parent's 1957-58 profit, before tax, was not due to any falling-off in business, but to the reduced profit margins. Subsidiary's profits, which rose by £11,487, would have been larger but for the development expenses of the Canadian company. Group profit, before tax, was lower by £219,781 at £905,039. Total dividend is repeated at 25 per cent. on a larger capital.

Satisfactory progress on the company's various projects is reported. The factory of the Canadian subsidiary has been completed and equipped. There has been some reorganization and partial re-equipment of the Scottish factories, and the extension to the South African factory has been completed.

Some Lifting of Export Control by India

Export control on more than 200 items has been lifted by India. The list includes linseed oil, electrical instruments, and appliances made of iron, steel, aluminium, brass, copper, and lead. The list of goods subject to quota regulation has been shortened, while the banned list now carries only a few essential items—largely of strategic value.

Many items, hitherto banned, will be licensed on an *ad hoc* basis so that the pace of export is regulated to suit demand in foreign countries. About 100 items for which exporters had to take out licences without any requirement of past performance have now been completely decontrolled. They include a number of chemicals, chrome, and diesel engines. Antimony, nickel, and tin ores, previously on the banned list, have also been removed from export restriction. Ferro-manganese, one of the commodities export of which so far has been permitted only on a restricted basis, will be allowed freely.

The Minister of Commerce and Industry, Lal Bahadur Shastri, envisages a delay of a week or two before a new import policy can be announced.

Detroit Learns from Britain

Mr. George M. Hama chairman of the Committee on Industrial Ventilation, City of Detroit Department of Health, recently visited Cornwall, to learn more of the Dustuctor low-volume high-velocity exhaust system which has been adapted for use with a wide range of portable grinders, pneumatic chisels, wire brushes, etc. It first came to Mr. Hama's notice at the American conference of Governmental Industrial Hygienists which was held at Lansing, Michigan in February, 1958, when a film of the system in operation was shown. American manufacturers encouraged by governmental agencies are, in general, extremely health and safety minded, and as there is no comparable system of dust control available in America Dustuctor is likely to become widely known and used.

THE COLORADO SCHOOL OF MINES, Golden, Colorado, this autumn has extended its metallurgical department and the new building provides classroom and laboratory facilities for 250 students.

Portugal to Have British Trade Fair

British industry is to be widely represented at the British Trade Fair to be held in Lisbon next year. Speaking at a Press conference in Lisbon recently, Mr. W. P. N. Edwards, a director of the Federation of British Industries and managing director of British Overseas Fairs, Limited, said that the fair was being staged to coincide with the Portuguese Government's second six-year development plan.

In addition to an all-British motor show there would be a comprehensive range of many of British industry's most modern products displayed. Iron and steel would be represented by the British Iron and Steel Federation and individual steel companies; shipbuilding by the Shipbuilding Conference; electrical engineering by such companies as the English Electric Company, Limited, and Metropolitan-Vickers Electrical Company, Limited; telecommunications and cables by such companies as Standard Telephones & Cables, Limited, and British Insulated Callender's Cables, Limited; diesel engines by such companies as Rolls-Royce, Limited, and the Brush Group, Limited, and chemicals by such companies as Imperial Chemical Industries, Limited.

BP Proposes One-for-One Scrip Issue

In the half year ended June 30, 1958, group sales of the British Petroleum Company, Limited, increased by £17,800,000 to £404,200,000 and it is proposed to capitalize £101,200,000 of reserves in making a one-for-one scrip issue. If this is approved the 6 per cent. convertible debenture rights will be doubled.

After estimated tax of £40,100,000 (£32,400,000) and deduction of income applicable to minority shareholders, the half-year's net income of £25,900,000 compares with £22,400,000 in the first half of last year and with £54,600,000 for the whole of 1957. Group sales were 9,000,000 tons higher at 31,000,000 tons in the first six months, the total 1957 tonnage being 53,000,000.

It should not be inferred from the proposed capitalization that the total to be distributed as dividend in respect of the current year will be greater than the 1957 distribution (10 per cent., tax free). The interim is maintained at 5 per cent., tax free, on existing capital and the final will be on the increased capital. The British Government holds £56,250,000 of the ordinary capital.

Aveling-Barford in Canada

Mr. H. C. Ryan, managing director of Aveling-Barford, Limited, the Grantham (Lincs) manufacturers of earth-moving machinery, road equipment, etc., will to-morrow (Friday) formally open the headquarters of the parent company's Canadian company, Aveling-Barford Canada, Limited, seven miles from the Toronto city boundary.

President of the new company is Mr. John M. Paterson, resident Canadian sales manager since 1948, while the directors are:—Mr. M. L. Baxter, Mr. R. B. Dales, Mr. H. C. Ryan, and Mr. Clive Barford. Mr. John H. Paget will be responsible for service organization at Toronto.

A NON-CONTRIBUTORY PENSION SCHEME is to be introduced by G. & J. Weir, Limited, the Glasgow engineers and founders, at the beginning of next year. The scheme will cover about 1,800 workers and will provide retirement pensions, sickness benefits, and death benefits where an employee dies in service.

Equipment and Supplies

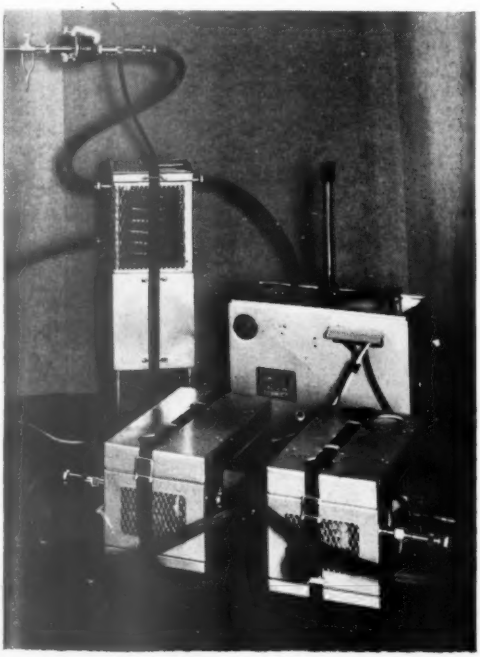
Isokinetic Dust-sampling Apparatus

The Longworth Scientific Instrument Company, Limited, Thames Street, Abingdon, Berks, are manufacturing an apparatus, shown in Fig. 1, for measuring the quantities of industrial fumes and dusts discharged into the atmosphere. The apparatus was developed by the British Iron and Steel Research Association. It is quite rapid in operation and consists, as is shown, of five separate parts—sampling probe, filter unit, cooling coil, pump units, and instrument unit. In addition, a combined pitot tube and pyrometer is provided for measuring gas velocities and temperatures.

A stainless-steel probe faces directly into the stream of dusty gas and a sample is withdrawn isokinetically, *i.e.* it flows into the nozzle in the same direction and with the same velocity as the local undisturbed gas stream, so that the dust content of the sample accurately represents that of the main gas stream at that point. The sample is then drawn through the weighed filter and cooled to ensure that corrosive liquids are not condensed in the sampling train. Two gas-tight vane pumps, equipped with by-pass valves and connected in parallel, then expel the filtered and cooled gas sample through a gas flow-rate indicator and an integrating meter. The filter is then re-weighed, and the concentration is obtained by dividing this mass by the volume of the gas sample.

In order to sample isokinetically, the gas velocity and temperature in the stack are measured with the combined pitot tube and pyrometer and indicated on the inclined gauge and millivoltmeter. Simple two-column tables are then used which relate this gauge reading to the isokinetic sampling rate, which is maintained by operating one of the by-pass valves. This simple method of flow-rate control is made possible by placing the meters after the pumps where gas pressures and temperatures are virtually constant.

FIG. 1.—*Longworth Isokinetic dust- and fume-sampling apparatus.*



Rates of gas and fume emission from steelmaking processes can vary rapidly; the sampling train must therefore collect a weighable sample of dust and fume very quickly. A robust filter assembly has accordingly been designed which incorporates a throw-away filter of graded glass fibres, held in a re-usable stainless-steel canister, the whole of which can be weighed on a chemical balance. The filter pads will filter iron-oxide fume from corrosive gases at 300 deg. C. at a rate of 3 cub. ft. per min., whilst the sampling probe and pitot tube can withstand a temperature of 650 deg. C.

Vacuum Valve

Mancuna Engineering, Limited, Denton, Manchester, have placed on the market a new vacuum valve for dust-collector hopper and bin discharges which, it is claimed, may find acceptance as a replacement for mechanical-type seals because of the complete security which it provides (Fig. 2). No power is required, as it functions automatically and, as there are no moving parts to wear out and cause leakage, no maintenance is needed. The valve operates on the simple vacuum principle, the seal being maintained by negative pressure within the valve, which collapses the flexible sleeve. The weight of collected material forces it through the sleeve at a constant rate of flow. The Neoprene rubber sleeve is resistant to most chemicals and can, it is stated, withstand temperatures of up to 175 deg. C.

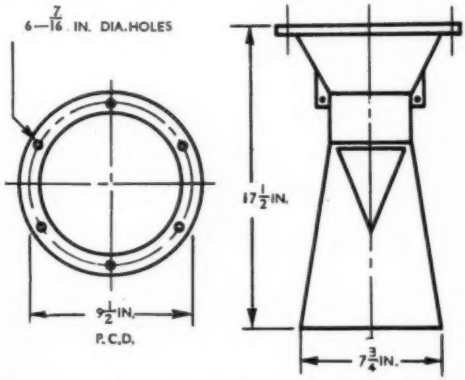


FIG. 2.—*Drawing, showing main features and dimensions of the "Mancuna-Dustex" vacuum valve.*

Plastic Welding Goggles

Safety Products, Limited, of Holmethorpe Avenue, Redhill, Surrey, have announced their "Pulsafe Weldcare" plastic welding goggle, which has been designed to meet the demand for a lightweight plastic goggle suitable for welding, with the one-piece lens affording unrestricted vision over a wide field (Fig. 3). Special features include the moulded frame in soft-green opaque p.v.c. and the replaceable lens of 0.050 in. non-inflammable green acetate conforming to light trans-

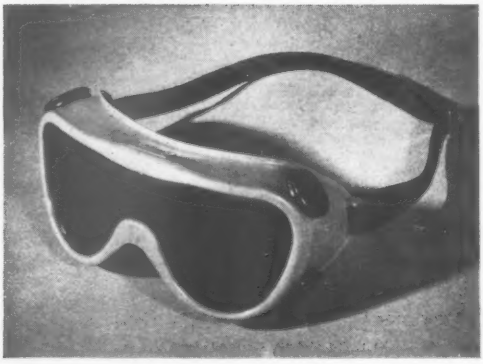


FIG. 3.—*"Weldcare" plastic welding goggles with one-piece lens.*

mission requirements of B.S.679, Shade 5. Ventilation is provided by four polythene baffle port ventilators fitted with wire-gauze inserts. These provide adequate ventilation and, at the same time, prevent the entry of light, dust and flying particles. The wide-angle vision of the one-piece lens helps to dispel the discomfort and feeling of restriction often mentioned as objections to the wearing of conventional-type goggles.

Floor Surfacing

J. H. Sankey & Son, Limited, Essex Works, Ripple Road, Barking, Essex, are the sole distributors in this country of a range of floor-surfacing compounds introduced into this country some 18 months ago. The range includes Snowtop, a coarse powder which is dusted over the surface of a wet concrete-base slab and trowelled in, thus producing a finished floor surface integral with the base concrete, and Sealtop, a liquid dressing with which floors can be proofed against a wide variety of oils and greases. The material is also available in any desired colour under the name Colourtop, and in heavy-duty grades for abnormally-heavy industrial use under the names of Metaltop and Emerytop. Metaltop, by reason of the metallic aggregate employed in its make-up, forms a conducting surface and is thus useful in preventing build-up of static electrical charges.

Large-capacity Buckets

Known in the civil engineering industry for their earth-moving equipment, Michigan (Great Britain), Limited, 3 to 5, Charles II Street, London, S.W.1, are now providing machines for bulk handling of lighter materials —such as coke, limestone, and sand, etc., in foundries—in the form of extra-large-capacity buckets now available for the 175A (Fig. 4) and 75A tractors. The former model, powered with a Leyland diesel engine developing 147 b.h.p., has a lifting capacity of between 6 and 7 tons and is now available with bucket capacity up to 5 cub. yd. nominal, carrying a heaped load of 6 to 7 cub. yd. The 75A model is powered by a Leyland or Perkins engine of 75/100 b.h.p. and has a lifting capacity of about 3½ tons, with a bucket capacity from 1¼ to 2½ cub. yd.

FIG. 4.—*The 5 cub. yd. capacity bucket now marketed by Michigan (Great Britain), Limited, fitted to the firm's 175A model tractor shovel.*

A RANGE OF BEARING WEDGES has been introduced by Martindale Electric Company, Limited, of Westmorland Road, London, N.W.9. The new tools have been developed to complement the company's range of pulley gear, flywheel and bearing pullers. They are designed to overcome the problem of removing bearings, sprockets, gears, etc., which are flush against a surface and where there is insufficient space for the insertion of standard puller arms. The wedges are constructed from the high-grade steel drop-forgings, and are available in three sizes, the capacities of which range from zero to five and three-quarter inches.

RAPID MAGNETIC MACHINES, LIMITED, of Lombard Street, Birmingham 12, announce that they are manufacturing deep-field circular lifting-magnets of a much deeper construction than conventional designs, giving up to 100 per cent. greater lift, dependent on the nature of the load. These magnets are well suited for operating in the foundry industry, lifting up to three-ton loads of iron-bearing material or scrap breaking balls of anything up to nine tons weight.

H. MABBS AND SONS, LIMITED, Britten House, 12, Tib Lane, Manchester, 2, announce that they have developed and placed on the market a line of quick-release leggings in which care has been taken to provide for comfort in use. The range includes knee-length, and short leggings and foot protectors.

AMONG EXHIBITORS at the Industrial Fuel Efficiency Exhibition, which is being held at Olympia (September 24 to October 3), is the British Vacuum Cleaner & Engineering Company, Limited (*Stand No. 14, outer row, section 31*). The company will be showing a range of vacuum equipment for industrial boiler cleaning, and other uses.

News in Brief

THE INTERNATIONAL PLASTICS EXHIBITION is to be held at Olympia, London, from June 17 to 27, 1959.

CLIMAX MOLYBDENUM COMPANY OF EUROPE, LIMITED, has changed its address to 2, Cavendish Place, London, W.1.

THE OFFICES of the British Bureau of Non-ferrous Metal Statistics have been transferred to 6, Vicarage Road, Birmingham 15.

ADVANCE MOTOR SUPPLIES, LIMITED, have opened a branch at 36, Albany Road, Cardiff. It is to be managed by Mr. J. C. Hambling.

TEN TONS of a special brass-alloy have been shipped to an American buyer by the Aston Chain & Hook Company, Limited, of Erdington; the metal is to go to a manufacturer of keys for the US car industry.

SPEAKER at the trade luncheon of the Gauge and Tool Makers' Association at the Savoy Hotel, London, W.C.2, on October 22 will be Mr. Ross Roy, president of Ross Roy, Inc., Detroit, Michigan, one of the largest advertising and marketing agencies in the US.

SHEEPBRIDGE EQUIPMENT, LIMITED, Chesterfield, Derbyshire, announce the appointment of Mr. J. S. Wood as their representative in the sand foundry division. His address is 19, Gregory Lane, Coventry, and he will be responsible for the firm's Midland Area.

EIGHT DIESEL PARCEL-VANS, powered by twin 150 h.p. engines, have been ordered from the Gloucester Railway Carriage & Wagon Company, Limited, by the British Transport Commission. They will be used in the areas of the London Midland and Western regions.

AN ORDER for supplying auxiliary transformers for the 132-kv sub-station at Bradwell-on-Sea, Essex, atomic-energy generating station of the Central Electricity Generating Board, has been received by Gresham Transformers, Limited, Twickenham Road, Hanworth, Middlesex.

THE MASTER CUTLER, Sir Frederick Pickworth, transferred on September 15, the name of the train which bears his title, to the new Pullman diesel which does the 161 miles between London and Sheffield in 2 hrs. 45 mins. compared with 3 hrs. 37 mins. by the former steam train.

MITCHELL RUSSELL & COMPANY, LIMITED, are closing their London offices at 36, Newman Street, London, W.1, on September 30. Thereafter the London staff of the company will operate from the offices of Smith & Wellstood, Limited, 63, Conduit Street, London, W.1.

AN APPEAL to the Minister of Housing and Local Government against the refusal of Wortley Rural Council to grant planning permission for the development of about 70 acres of land as an industrial estate at Smithy Wood, Ecclesfield, near Sheffield, is to be made by Newton, Chambers & Company, Limited.

SHORTLY AFTER OPENING the Zagreb International Trade Fair, Yugoslavia, on September 6, President Tito spent some time inspecting the mobile demonstration unit of Kelvin & Hughes (Industrial), Limited, Wembley, Middlesex, which has been touring the Continent and is now showing the company's products in Yugoslavia.

UNITED STEEL COMPANIES announce that during a recent four-week period the Ajax furnace at Scunthorpe produced a record 19,263 tons of steel, making over 5,000 tons per week in three of the four weeks. This is believed to be the highest output ever attained by an open-hearth furnace in this country. The furnace uses oxygen lancing and has been specially designed.

AN EXHIBITION of scientific and industrial equipment, organized by Engelhard Industries, Limited—Baker platinum division and Hanovia lamps division—is to be held at the Midlands Electricity Board showrooms, 247, Chester Street, Aston, Birmingham, 6, from Monday, September 29, to Friday, October 10. It will be open from 10 a.m. to 12 noon and from 2 to 4.30 p.m.

FOLLOWING THE ANNOUNCEMENT of the relaxation of hire-purchase controls, the David Brown Tractor Division, of Meltham, near Huddersfield, has announced that with immediate effect the initial deposit required on new tractors and implements is to be reduced from 33⅓ to 10 per cent. where repayments are made over a period of up to two years, and 15 per cent. for two- to three-year repayments.

DETAILS OF a turbo-prop engine to be built in this country under licence from the General Electric Company of America have been announced by the de Havilland Engine Company, Limited. The engine, a development of the American T58, is to be called the Gnome, and is light, robust, and easy to maintain. It develops 1,000 shaft horsepower and is suitable for helicopters and short and medium range aircraft.

THE INAUGURAL MEETING of the Shropshire branch of the Institute of Industrial Supervisors was held at the Wellington factory of Joseph Sankey & Sons, Limited, on September 16, when the following appointments were made: as branch president, Mr. G. B. Sankey, director and general manager of Sankey's; as vice-president, Mr. E. Bailey, principal of Walker Technical College, Wellington; and as acting secretary, Mr. J. Shepherd, also of Sankey's.

A TWO-DAY STRIKE of 350 moulders and dressers at the works of the North British Steel Foundry, Limited, Bathgate, ended when the men returned to work last week pending further negotiations. The strike followed a dispute on the question of redundancy and the dismissal of 76 men. The foundry is on short time and the men wanted the available work shared and no dismissals, but the employers indicated that they had gone as far as possible in sharing out the work.

A VALUABLE DOLLAR-EARNING CONTRACT for the water turbines and governors to be installed in a new power station in Persia has been secured, in the face of strong international competition, by the Harland Engineering Company, Limited, Alloa. The power station is being constructed in the Elburz Mountains, near Teheran, for the Karadj Dam Authority, by Morrison-Knudsen International Constructors, Inc., and their consulting engineers, Harza Engineering Company International.

THE HAMILTON (LANARKSHIRE) WORKS of A. Baird & Son, Limited, ironfounders and engineers, are to be closed for a temporary period because of a lack of orders. The 160 men employed who have been working a four-day week for the past three weeks, have received notices terminating employment. The firm has a big trade in castings for Glasgow firms engaged in shipbuilding, sugar manufacture machinery, and crane building. It also specializes in castings for rolling mills and in moulding-machine gears.

THE BIRMINGHAM DESIGN COUNCIL for the gold, silver and jewellery industries of which Mr. Stanley E. J. Ward is chairman, is holding an exhibition of silverware and plated ware, fancy goods and jewellery in a department stores in Birmingham. The exhibi-

News in Brief

tion (which closes on October 4) covers a wide range of goods, the designs of which mainly show a tendency to streamlined simplicity, with traditional lines predominant. Manufacturers believe that they can compete with German firms and that prices offered are competitive.

THE SIXTH ANNUAL CONGRESS *of the Fédération Européenne de la Manutention* (the European Mechanical Handling Federation) will be held in Ostend, Belgium, from October 14 to 18. More than 200 delegates representing the mechanical-handling industry in 13 European countries have already indicated their intention of being present. In addition some representatives from the United States of America have been invited and are expected to attend. The Permanent Secretariat of the Fédération Européenne de la Manutention is at Syndicat M. T. P. S.: 10, Avenue Hoche, Paris, 8.

NEW SHOWROOMS AND OFFICES, designed to serve as a base for the company's European operations, have been acquired by the Pressed Steel Company of Cowley, Oxford, in Brussels. The new premises, which are in the Galerie Ravenstein, were officially opened on September 16 by Mr. Longerstaey, Chef de Cabinet to the Belgian Minister for External Trade. The company's Prestcold refrigerators are already well known in Europe, and it now looks forward to expanding in Europe business in its other two lines of production, car bodies and railway wagons.

ONE OF THE FINEST WELDING LABORATORIES in a technical college will be opened soon at the Matthew Boulton Technical College in Suffolk Street, Birmingham. Modern welding equipment for the new laboratory was supplied by Quasi-Arc, Limited, of Bilston, Staffs. The head of the engineering department at the college, Mr. J. A. Forrest, has revealed that in the past, welding students had to be turned away because of lack of space. The opening of the new Advanced College of Technology at Gosta Green, however, had made more accommodation available at Suffolk Street and plans for the new laboratory were developed.

EXECUTIVES REPRESENTING A CROSS SECTION of the chief industries of Birmingham held a meeting on September 19 with five Birmingham socialist M.P.s. After the meeting it was stated that Birmingham unemployment figures would be much higher were it not for the fact that the motor interest is running against the national trend of production and is booming. Mr. Roy Jenkins, M.P. for Stechford, said that the picture given at the meeting by the industrialists held out little hope of an improvement in other sections of industry, so that the prospect for Birmingham might be one of gradually-increasing unemployment.

LORD MILLS, Minister of Power, will open the one-day conference at Birmingham, on November 22, which the Council of Industrial Design is sponsoring in conjunction with the Birmingham Exchange and Engineering Centre. The theme of the conference, which is the first of its kind in the UK, is "Industrial Design and the Engineering Industries." Ways and means of improving the form and function of engineering products will be discussed, as will also the need for introducing design training into engineering courses. In conjunction with the conference a photographic exhibition of well-designed engineering products from Britain and Europe will be shown at the Midland Hotel, Birmingham.

Recent Wills

SPURGEON, N. C. A., deputy managing director of the Lockheed Hydraulic Brake Company, Limited, Leamington Spa £21,138

BRACKEN, VISCOUNT, whose directorships included a seat on the board of Associated Electrical Industries, Limited £145,735

SWINBURNE, SIR JAMES, FRS, a pioneer in the development of plastics and chairman of Bakelite, Limited, past president of the Institution of Electrical Engineers and of the Faraday Society £43,367

THICKETT, W. H., retired shiprepairer and boat builder, of Grimsby £20,828

YOUNG, R. V., an executive of Braithwaite & Company, Engineers, Limited, London, S.W.1 ... £33,514

WINDSOR-RICHARDS, A. W., of Hove (Sussex), retired iron and steel works consultant metallurgist ... £12,739

LINFOOT, W. E., a director of the former Campbell Gas Engine Company, Limited, Halifax (Yorks) £3,322

HARDILL, G. W., a director and secretary of William Hardill, Sons & Company, Limited, saw mill engineers and ironfounders, of Cleckheaton (Yorks) £3,614

MORISON, SIR JOHN, chairman of the Iron and Steel Holding and Realization Agency £91,134

CORNTHWAITE, W. M., of Bradwell (Derbyshire), formerly of Sheffield, steel manufacturer ... £11,666

WAINE, A. H., a director of Hadfields, Limited, Sheffield, and managing director of Hadfields Forgings, Limited £4,174

BUCHANAN, J. G., late director and chairman of William Jacks & Company, Limited, iron, steel, and metal merchants, of London, E.C.2, and a director of the Expanded Metal Company, Limited, London, S.W.1 ... ... £193,577

Contracts Open

The dates given are the latest on which tenders will be accepted. The addresses are those from which forms of tender may be obtained. Details of tenders with the reference ESB can be obtained from the Board of Trade Export Services Branch, Lacon House, Theobalds Road, London, W.C.1 (telephone: CHAncery 4411, ext. 738 or 771), unless otherwise stated.

CEYLON—Hayleys, Limited, 400 Deans Road, Colombo, 10, have advised the United Kingdom Trade Commissioner at Colombo, that they would like to obtain United Kingdom agencies for plumbers' brassware. (ESB/22581/58.)

PAKISTAN, October 9—Cast-iron spigot and socket piping and flanges. (ESB/22553/58.)

POCKLINGTON, October 15—Provision and laying of approximately one mile of 3-in. dia. spun-iron water main in connection with Kirby Underdale water supply, contract No. 17. Documents from John H. Haiste & Partners, Belmont House, 20, Wood Lane, Headingley, Leeds, 6.

SOUTH AFRICA, October 16—One four-ton self-propelled tandem vibrating roller. (ESB/22776/58.)

SPALDING, October 1—Requirements for Sharp's Bridge sewerage scheme include 1,640 yd. of cast-iron pipe sewers and 530 yd. of pumping main. Documents from Mr. L. A. Gornall, surveyor to the Council, Short Street, Spalding, Lincs.

New Company

Birlec, Limited, and Efco, Limited, the two leading electric furnace manufacturers, announce that negotiations between them for the formation of a new company, to take over certain sections of their business, have reached an advanced stage. It is intended that the new company shall be called Birlec-Efco (Melting), Limited, and that its offices shall be near Birmingham, at Aldridge, Staffs. The intended scope of the company is the design and supply of all types of electric melting furnaces for the ferrous and non-ferrous metals industries, together with smelting furnaces and induction-heating equipment. The personnel of the new company will be drawn from the appropriate divisions of the two companies, thus combining in one organization the specialist techniques and extensive experience of both companies. Birlec and Efco will continue independently to manufacture their respective heat-treatment furnaces and other plant.

Personal

Major C. J. P. BALL has joined the board of BTR Industries, Limited.

Mr. J. C. DICKINSON has been appointed shipbuilding manager of Scotts' Shipbuilding & Engineering Company, Limited.

Commander H. PASLEY-TYLER, joint general manager of Elliott Brothers (London), Limited, has been appointed to the board.

Mr. A. W. JEFFS has been appointed chairman of John Shaw & Sons, Limited, Wolverhampton, following the death of Mr. R. P. JENKS.

Mr. A. D. MCKILLOP, at present works manager of R. Y. Pickering & Company, Limited, Wishaw, has been appointed a director of the company.

Mr. JAMES ROYCE has recently been appointed to the board of Hedin, Limited, manufacturers of industrial electric-heating equipment, South Woodford, London, E.18.

Mr. MAURICE TATTERSFIELD has been appointed financial controller to the George Cohen 600 Group, Limited. Mr. Tattersfield has resigned his directorship of the Brush Group, Limited.

Mr. J. M. SMITH has been appointed chief designer in the Maybach diesel-engine division of Armstrong Siddeley. He was formerly chief engineer, diesel-engine division, of the English Electric Company, Limited.

The director of the British Welding Research Association, Dr. RICHARD WECK, has accepted an invitation from the American Society for Metals to lecture to its seminar on "Residual Stresses" at Cleveland, Ohio, during the 40th national congress of the Society.

Mr. ALBERT HAWKE, assistant accident prevention officer of the Park Gate Iron & Steel Company, Limited, Rotherham, for many years, has been appointed vice-chairman of the West Riding Urban District Council's Association. He has been a member of Rawmarsh Council since 1947 and was chairman three years ago.

The United Nations Technical Assistance Committee, at the request of the Federal Government of Nigeria, has appointed Mr. HOWARD C. RENKEN to conduct an investigation into the possibility of producing pig-iron in Nigeria, using local iron ore and coal. Mr. Renken is consultant in the metallurgical division of the Battelle Memorial Institute, Columbus (Ohio).

Following the request of Sir HAROLD YARROW, chairman and managing director of Yarrow & Company, Limited, shipbuilders, Glasgow, since 1922, to be relieved of his position as managing director, the board of directors have appointed his son, Mr. ERIC YARROW, to be managing director with effect from October 1, Sir Harold, who is 74, will remain chairman of the company.

Captain R. L. JORDAN, who was recently appointed a director of the Merseyside engineering firm of Fawcett Preston & Company, Limited, has now joined the boards of Brookhirst Switchgear, Limited, of Chester, and Farmer Brothers (Shifnal), Limited, of Shifnal, Shropshire. All three companies are in the Metal Industries Group. Captain Jordan was formerly engineer manager of the Royal Naval dockyard at Chatham.

Members of the John Thompson Supervisors' Association made a presentation, on September 19, to Mr. W. L. RODEN who retired this month from the post of apprentice training supervisor to the John Thompson group, a post he had held for 13 years. Mr. Roden was largely responsible for a reorganization of the group's training scheme, and to-day some 300 apprentices are receiving training at factories in Ettingsall, Wolverhampton, Dudley, Leeds and Glasgow.

Summerson's Foundries, Limited, Mowden Hall, Darlington, announce that Mr. C. WHITEHOUSE has been appointed works manager. Mr. Whitehouse started his foundry career in 1921 as a moulder with F. H. Lloyd & Company, Limited, steel founders, Wednesbury. He was made supervisor in 1939, and in 1945 was transferred to Lloyds (Burton), Limited, as foreman, eventually being promoted to foundry manager in 1951. He resigned this position in 1953 to take up an appointment as foundry manager with John Hill & Son, iron founders of Wolverhampton.

Four specialist regional technical sales engineers have been appointed by Winston Electronics, Limited, Shepperton (Middx). Mr. K. P. REYNOLDS, based in Manchester, covers Yorks, Lancs, Cheshire, and the north. Mr. P. REEVES, based in Birmingham, is responsible for Derbyshire, Notts, Lincs, Staffs, Shropshire, Worcs, Northants, Leics, and Rutland. Mr. V. DIEDERICHS covers London south of the Thames, Gloucestershire, Oxon, Wilts, Berks, Hants, Dorset. Sussex, Kent, and Surrey, while Mr. D. A. JAMISON covers the London area north of the Thames, Cambridgeshire, Herts, Bucks, Beds, and Middx.

George Kent, Limited, announce the following board changes:—Mr. T. P. W. MORRIS, lately chief personnel officer of the Vickers Group, previously labour manager of ICI Billingham Division, and a former president of the Institute of Personnel Management, has been appointed deputy chairman. Mr. R. E. HANDFORD, B.SC., deputy managing director, after 45 years in the company's service, 25 of which as a director, relinquishes his executive functions and retains his seat on the board. Mr. W. A. HARTOP, who joined the company in 1927 and was appointed to the board in 1943, has been appointed managing director. Commander P. W. KENT, formerly chairman and managing director, remains as chairman. Two directors, Mr. W. GUY ARDLEY and Mr. LESLIE H. KENT, are to retire on September 30.

Obituary

Mr. PERCY COOK, works manager of Dartmouth Auto Castings, Limited, Smethwick, Birmingham, has died at the age of 49. He joined the firm in 1933 and had been works manager since 1948.

Mr. WILLIAM WESTON SHARPE, for a number of years sales promotion manager of Allis-Chalmers Great Britain, Limited, agricultural engineers, of Essendine (Lincs), has died at the age of 65, eight months after his retirement from the firm.

The death is announced of Mr. W. H. BLAKE, who founded the firms of W. H. Blake & Company, Limited, the Coleridge Engineering Company (Sheffield), Limited, and Blakes Foundry, Limited. He was chairman and managing director of the concern which bears his name.

Mr. LEONARD VOWLES, late chairman and managing director of Vowles Aluminium Foundry Company, Limited, West Bromwich, died after a long illness, on September 12, at the age of 59 years. Mr. Vowles was the original founder of the company in 1929, and was a well-known figure in the foundry industry in the Black Country. He retired from the company during his past illness in 1957, when the company joined the Triplex Foundries Group.

Raw Material Markets

Iron and Steel

Pig-iron output in all grades exceeds present demands and producers still find it necessary to place appreciable tonnages into stock. Efforts are made to dispose of tonnages as they arise, but consumers maintain the policy of specifying supplies for current use only and forward buying is negligible. Outputs of basic pig-iron are on a good scale, but with the reduced outputs of ingots steelworks' requirements are that much less so that tonnages available are more than ample both for consumption and stock requirements.

A similar position applies to all the foundry grades of pig-iron. With the extra supplies now available of the low-phosphorus irons, which continue in the biggest demand, the previous scarcity in supplies of this grade has been overcome and a much larger tonnage could be delivered if demands warranted. Supplies of hematite also exceed demand, and refined irons are plentiful. The foundries using high-phosphorus irons are able to get all they need without difficulty and surplus tonnages remain after requirements are met.

Home demands show little variation from recent deliveries and, although increased business could be undertaken for the export market, orders are difficult to obtain in face of strong overseas competition. The engineering and speciality foundries maintain a fairly good and steady rate of output of castings. Users of high-quality castings are scheduling regularly for supplies, but the pressure for deliveries is not now so heavy. The light-castings trade is badly in need of more work, many of the jobbing foundries are quiet, and only moderate business is being done by the textile foundries.

With the possible exception of the better and heavier grades of cast-iron scrap, the foundries are well provided with supplies. Foundry coke deliveries are satisfactory, apart from some grades of Welsh foundry coke, and ganister, limestone, and firebricks are available on demand.

The position at the re-rollers shows little change. Production varies, but the majority continue on a day-to-day basis so far as orders are concerned, and rolling programmes are difficult to arrange. Nor is there any appreciable change in the demand for small bars and light sections; in fact, for all the products of the re-rollers a much larger volume of work could be undertaken. Only a few export orders are on hand as makers abroad can quote much lower figures than UK prices. Some business, however, continues to be obtained for Siemens and special-quality steels.

Plentiful supplies of steel semis are available from home steelworks, and current deliveries are much below the tonnages which could be supplied.

Non-ferrous Metals

Tin, a poor market for many months past, collapsed on Thursday of last week when the buffer stock manager failed to support the floor price of £730 a ton. The International Tin Council subsequently confirmed the action, stating that the manager had temporarily withdrawn his support and that the council would meet to discuss the position. Market reaction was immediate and drastic, the price of tin dropping by nearly £100 a ton to close at £642 10s. 0d. a ton—its lowest level since November, 1953. Since that time, however, the price has picked up appreciably on buying from the UK, the Continent, and the United States by those who found the opportunity attractive to average out their recent purchases. In America the fall was just as steep and the quotation has come back to around 85½ cents a pound.

The withdrawal of support, it has been said, did not come as a complete surprise. Yet forecasts that it would happen—and so soon—have been singularly lacking. What was felt was that the buffer stock manager could not go on absorbing tin at the floor level price in the quantities it had been compelled to buy for any length of time without further buttressing the cash resources of the special fund created for the purpose. There were, too, strong political reasons for thinking that, whatever else, the scheme would not be allowed to fail. The only point, however, worth discussing is that it has failed to maintain the price, responsibility for which can be laid squarely at the door of Russia, who persistently offered supplies at prices below the International Tin Council's agreed support point of £730 a ton. The action taken by the Soviet block countries unnerved the market, destroyed confidence and, generally, prevented the scheme from ever having a reasonable opportunity to operate as planned.

The consequences are dire for countries like Malaya and Indonesia, whose economies depend for their viability on a reasonable price for the metal. Indeed, 30 per cent. of the Malayan tin miners were already unemployed before the collapse of the scheme and 37 per cent. of the mines had closed down.

For an indefinite period, it would seem the tin price is going to be allowed to find its own level in terms of supply and demand. Once that has been ascertained it will be necessary for the council to consider a new floor price. But if this should prove to be on the low side, the producer countries may well not agree to it. Meanwhile, the quota restrictions are to remain in force, together with the import restrictions imposed by various countries, including the UK, on tin supplies from Soviet sources. On the political side, there would appear to be a *prima facie* case for the members of the Tin Council supporting the scheme instead of giving way to Russia and admitting that her action in deliberately sabotaging the scheme had been successful. In fact, with the tin-producing countries fully aware that the breakdown of the scheme has been caused by Russia, the opportunity must be seized by the West with both hands to go to the aid of the tin producers. Otherwise it says very little for the solidarity of capitalism in a crisis.

Copper is a firm market and is likely to be even firmer in the weeks ahead if the Copperbelt strike cannot be settled. All the copper-producing mines on the Copperbelt, which last year produced some 430,000 tons, are closed down because about 4,000 European mineworkers have struck on the question of what kinds of skills and status are required to do certain jobs. This question involving the demarcation line as to certain degrees of skill necessary to carry out certain jobs is not, however, thought to be the real underlying bone of contention. The crux of the matter would seem to be a test of strengths between management and labour as to which side will have the prime right to decide on how the mines are to be run. Without all the facts available on which to discuss the dispute it is impossible to analyse it and offer any kind of constructive criticism. From this distance the strike seems curiously infantile and will only redound to the benefit of the American producers. The United States is the only alternative source of supply. But if, as is expected, demand improves visibly over the next three months, the repercussions of having no supplies of copper available from Rhodesia will be reflected in a sharp upward movement of the price. It is estimated that the UK has enough stocks in the country to meet demands until around mid-November.

In America, events on the Copperbelt and in the Far East have caused better buying of copper and the price was raised in two successive stages last week by the US custom smelters. Each price rise was ¼ cent and the quotation now stands at 26½ cents a pound, the same level as that quoted by the primary producers.

It was announced in Washington on Monday that the Administration was imposing quotas on lead and zinc imports into the United States as from October 1. They will reduce the total annual imports by about 20 per cent. The announcement stated that President Eisenhower had approved a finding of the tariff commission to the effect that the lead and zinc industry was suffering injury from increasing imports, and that he had therefore invoked the escape clause in the Reciprocal Trade Agreements Act. As expected, strong complaints against the US Government's action were forthcoming from Canada, Australia, Mexico, Peru, Bolivia, and elsewhere.

Lead has been a better market on both sides of the Atlantic. Prices have edged up in London, and in America the official price has been raised ¼ cent to 11 cents a pound. The recent improvement is partly due to demand considerations. Zinc, too, is steady and the price in London has improved. In the US buyers are coming for "Prime Western" and hopes are that the new automobiles for 1959 will tempt the public to buy. The UN metals conference also included zinc as one of the two metals member governments ought to be asked to restrict their exports over the next year. The US price is still holding at 10 cents a pound.

Forthcoming Events

SEPTEMBER 26

Incorporated Plant Engineers

Birmingham branch : "Planned Maintenance," by A. F. R. Stedman, 7.30 p.m., at the Imperial Hotel, Temple Street.

SEPTEMBER 27

Institute of British Foundrymen

West Riding of Yorkshire branch : Council meeting, 4.45 p.m., presidential address by R. Mercer, 6.30 p.m., followed by film show. Meeting to be held at Bradford Institute of Technology.

SEPTEMBER 29

Incorporated Plant Engineers

West and East Yorkshire branch : "Mechanical Plant and Railway Engineering," by A. C. Layhe, 7.30 p.m., in the Fuel Department Lecture Theatre, New Building, Leeds University.

Institute of British Foundrymen

SEPTEMBER 30

Slough section : Brains Trust—"Precision-casting Techniques," 7.30 p.m., in the Lecture Theatre, High Duty Alloys, Limited, Slough.

OCTOBER 2

Stoke-on-Trent section : Presidential address followed by "Mould and Core Production by CO_2 Practice," by T. C. Wilson, 7.30 p.m., at the Stipendiary Court Room, Hanley Town Hall.

OCTOBER 3

West Wales section : "Practical Experiences in Making Moulds in a Mechanized Foundry," by H. Pinchin, 7 p.m., at Richard Thomas & Baldwins, Limited, Landore.

OCTOBER 4

Wales and Monmouth branch : "Practical Experiences in Making Moulds in a Mechanized Foundry," by H. Pinchin, 6 p.m., at Newport Technical College.

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September 24, 1958

PIG-IRON

Foundry Iron.—No. 3 IRON, CLASS 2: Middlesbrough, £21 6s. 0d.; Birmingham, £20 18s. 3d.

Low-phosphorus Iron.—Over 0.10 to 0.75 per cent. P, £23 17s. 0d., delivered Birmingham. Staffordshire blast-furnace low-phosphorus foundry iron (0.10 to 0.50 per cent. P, up to 3 per cent. Si), d/d within 60 miles of Stafford, £24 1s. 3d.

Scotch Iron.—No. 3 foundry, £25 3s. 6d., d/d Grangemouth.

Cylinder and Refined Irons.—North Zone, £25 19s. 0d.; South Zone, £26 1s. 6d.

Refined Malleable.—P, 0.10 per cent. max.: North Zone, £27 6s. 6d.; South Zone, £27 9s. 0d.

Hematite.—Si up to 2 per cent., S. & P. over 0.03 to 0.05 per cent.: N.-E. of England (local iron), £25 6s. 6d.; Scotland (Scotch iron), Zone S.1, £25 13s. 0d.; Sheffield, £26 15s. 0d.; Birmingham, £27 4s. 0d.; Wales (Welsh iron), £25 6s. 6d.

Basic Pig-iron.—£20 3s. 0d., delivered Staffs, Derbyshire, Notts, Lincs, Rutland, Northants, and Leics.

FERRO-ALLOYS

(Per ton unless otherwise stated, delivered)

Ferro-silicon (6-ton lots and over).—45 per cent. Si, £44 0s. 0d. to £44 10s. 0d., scale 15s. 0d. per unit; 75 per cent. Si, £62 0s. 0d. to £62 10s. 0d., scale 17s. 0d. per unit.

Ferro-vanadium.—50/60 per cent., 22s. 6d. per lb. of V.

Ferro-molybdenum.—65/70 per cent., carbon-free, 12s. 6d. per lb. of Mo.

Ferro-titanium.—20/25 per cent., 2-3 per cent. Cu, £250 0s. 0d.; 38/40 per cent., commercially carbon-free, £287 0s. 0d.

Ferro-tungsten.—80/85 per cent., 6s. 6d. per lb. of W.

Tungsten Metal Powder.—98/99 per cent., 9s. 6d. per b. of W.

Ferro-chrome (6-ton lots and over).—4/6 per cent. C, £83 10s. 0d. to £87 0s. 0d., basis 60 per cent. Cr, scale 30s. 0d. to 30s. 6d., per unit; over 6 per cent. C, £79 10s. 0d. to £85 0s. 0d., basis 60 per cent. Cr, scale 30s. 6d. per unit; 2 per cent. C,* 2s. 0d. per lb. Cr; 1 per cent. C,* 2s. 0¼d. per lb. Cr; 0.15 per cent. C,* 2s. 1¼d. per lb. Cr; 0.10 per cent. C,* 2s. 1¾d. per lb. Cr; 0.06 per cent. C,* 2s. 2d. per lb. Cr.

Metallic Chromium.—98/99 per cent., 6s. 10d. per lb.

Metallic Manganese.—94/96 per cent., carbon-free, £265 0s. 0d.; 96/98 per cent., £295 0s. 0d.

Ferro-columbium.—65/72 per cent., Nb + Ta, 19s. 9d. per lb., Nb + Ta.

Ferro-manganese (home).—78 per cent., £78 0s. 0d.

SEMI-FINISHED STEEL

Re-rolling Billets, Blooms, and Slabs.—BASIC: Soft u.t., £32 15s. 6d.; tested, 0.08 to 0.33 per cent. C, £33 15s. 6d.; hard (0.41 to 0.60 per cent. C), £34 17s. 0d.; silico-manganese, £43 16s. 6d.; free-cutting, £36 14s. 6d. SIEMENS MARTIN ACID: Up to 0.25 per cent. C, £41 1s. 0d.; silico-manganese, £44 4s. 0d.

* Average 68-70 per cent.

Billets, Blooms, and Slabs for Forging and Stamping.—Basic, soft, up to 0.33 per cent. C, £38 10s. 0d.; basic, hard, over 0.41 up to 0.60 per cent. C, £39 12s. 6d.; acid, up to 0.25 per cent. C, £43 4s. 0d.

FINISHED STEEL

Heavy Plates and Sections.—Ship plates (N.-E. Coast), £42 2s. 0d.; boiler plates (N.-E. Coast), £44 12s. 0d.; floor plates (N.-E. Coast), £43 11s. 0d.; angles (N.-E. Coast), £39 16s. 6d.; joists (N.-E. Coast), £39 12s. 6d.

Small Bars, Sheets, etc.—Rounds and squares, under 3 in., and flats 5 in. wide and under, untested soft basic, 50 tons and over, £40 0s. 6d.; under 10 tons to 4 tons, £40 18s. 0d.; under 4 tons to 2 tons, £41 3s. 0d.; hoop and strip, coils, £39 0s. 0d.; uncoated strip mill coils, hot rolled, under 3mm. to 12g., £44 16s. 0d.; black sheets (hand mill), 24g., £58 14s. 6d.; galvanized corrugated sheets, 24g., £66 16s. 0d.

Alloy Steel Bars.—1 in. dia. and up: Nickel, £68 10s. 0d.; nickel-chrome, £99 11s. 0d.; nickel-chrome-molybdenum, £111 19s. 0d.

NON-FERROUS METALS

Copper.—Cash, £212 0s. 0d. to £212 5s. 0d.; three months, £212 0s. 0d. to £212 5s. 0d.; settlement, £212 5s. 0d.

Copper Tubes, etc.—Solid-drawn tubes, 1s. 11½d. per lb.; rods, 220s. 0d. per cwt. basis; 20 s.w.g., 253s. 3d. per cwt.

Tin.—Cash, £695 0s. 0d. to £700 0s. 0d.; three months, £687 10s. 0d. to £690 0s. 0d.; settlement, £700 0s. 0d.

Lead (Refined Pig).—Second half September, £69 0s. 0d. to £69 5s. 0d.; second half December, £70 0s. 0d. to £70 5s. 0d.

Zinc.—Second half September, £64 5s. 0d. to £64 10s. 0d.; second half December, £64 15s. 0d. to £64 17s. 6d.

Zinc Sheets, etc.—Sheets, 15g. and thicker, all English destinations, £99 10s. 0d.; rolled zinc (boiler plates), all English destinations, £97 5s. 0d.; zinc oxide (Red Seal), d/d buyers' premises, £87 0s. 0d.

Brass Tubes, etc.—Solid-drawn tubes, 1s. 7½d. per lb.; sheets to 10 w.g., 174s. 3d. per cwt.; wire, 2s. 5d.; rolled metal, 174s. 3d. per cwt.

Brass (Brazing).—BS1400, B3 (65/35), £140; B6 (85/15), £184; BS249, —.

Brass (High Tensile).—BS1400, HTB1 (30 tons), £173; HTB2 (38 tons), £180; HTB5 (48 tons), —.

Gunmetal.—BS1400, LG2 (85/5/5/5), £174; LG3 (86/7/5/2), £186; G1 (88/10/2/½), £242; (88/10/2/1), £232.

Phosphor Bronze.—BS1400, PB1 (AID released), £262 per ton.

Phosphor Bronze Strip, etc.—Strip, 256s. 6d. per cwt.; wire, 3s. 9½d. per lb.; rods, 3s. 0½d.; tubes, 3s. 0½d.; chill cast bars: solids 3s. 0½d.; cored 3s. 1½d. (CHARLES CLIFFORD, LIMITED.)

Nickel Silver, etc.—Rolled metal, 3 in. to 9 in. wide × 0.056, 3s. 7d. per lb.; round wire, 10g. in coils (10 per cent.), 3s. 11½d.; special quality turning rod, 10 per cent., ½ in. dia., in straight lengths, 3s. 10½d. All prices are net.

Other Metals.—Magnesium, ingots, 2s. 5½d. per lb. Antimony, English, 99 per cent., £190 0s. 0d. Quicksilver, ex-warehouse, £79 0s. 0d. Nickel, £600 0s. 0d. Aluminium ingots, £180 0s. 0d.; aluminium bronze (BS1400), AB1, £207; AB2, —.

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REVERBALE

- Throughput up to 800 lbs. per hour
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New Catalogues

Epoxide Resins.—Bakelite, Limited, 12-18, Grosvenor Gardens, London, S.W.1, have issued three information sheets (E.23, E.28 and E.29). Leaflet E.23 describes how in the manufacture of press tools, patterns, jigs and moulds from the firm's epoxide resins, a method widely used is that in which a non-draining thixotropic facing-coat of filled resin is applied to the pattern, allowed to "body," and backed by a casting or laminate. The facing coat formulation consists of a mixture of resin, filler, thixotropic agent and hardener which have hitherto been supplied separately and mixed prior to use. To simplify the process and reduce the amount of handling involved by users, the Bakelite concern is now marketing DR.19114, which is a "premix" of epoxide resin, slate-dust filler and Aerosil thixotropic agent, details of which are set out.

Leaflet E.28 gives information on the work carried out in the firm's laboratories which has resulted in the development of a new reactive "flexibilizer," DQ.19116. This is a modified amine designed to obviate handling difficulties; it has little odour, is miscible with most of the normal hardeners used with epoxide resins and gives mixes of low viscosity which can be poured easily. The final publication referred to, E.29, gives details of a new hardener, DQ.19117, which has been introduced for use with R.18774/1 resin. The combination of resin and hardener gives a cold-setting system which may be used in casting, laminating, as an adhesive or as a brush setting cement.

Special Iron Castings. Ranking high amongst trade literature covering alloyed cast irons is a catalogue "Sound and Solid Castings," received from John Williams & Sons (Cardiff), Limited, East Moors Road, Cardiff. The trade mark—a stylized dragon's head with the letters JW imposed on it—is, though without the initials, now figuring on the stamps commemorating the Empire Games. It is a very good trade mark and as such should be impressed on every casting the firm manufactures. The catalogue has rightly been compressed to about 10 pages, but in it all the cardinal points are properly set out—the "ripe" age of the company; the steps it takes to ensure high quality; the properties of the various alloys made (both as tables and graphs and where comparisons are shown with competing alloys); the special properties of s.-g. irons and finally the machining facilities available within the firm.

In this latter respect, the catalogue goes further than most, inasmuch as it details the capacities of the machine-tools installed. This is just the type of information an engineers' buyer appreciates. When a new catalogue is to be produced, it would be an improvement to designate tabular matter by table number and not by figure numbers. The illustrations of the machine-shops have probably suffered somewhat as to clarity through being printed on stiff card. Beyond those very mild criticisms, the reviewer has nothing but praise for the layout and letterpress.

Reverberatory Melting Furnaces.—Sklenar Furnaces, Limited, 385, Newport Road, Cardiff, in Publication No. 283, give very full illustrated details of reverberatory melting furnaces, the major applications for which are to be found in the foundry. The brochure is a very attractive one and good use has been made of colour printing. It incorporates interesting data on fuel consumption and test results, also details are given of the services accorded to clients. The five main standard types, ranging in capacity from 50 lb. of bronze to a 5-ton plant, are illustrated on one page and, facing it, the germane technical data are set out. Then the two bale-out furnaces—covered by the trade name Reverbale—are similarly treated, but no reference is made to the improvement of shop-working conditions this type of furnace gives over the usual open-top holding furnaces. Finally, there is a note on special furnaces.

Silica Sand.—In publication No. 90, General Refractories, Limited, Genefax House, Sheffield describe—mainly by good illustrations—their plant for the preparation of Chelford silica sand. Amongst the technical information printed are the B.S.I. grading, plus that of the A.F.S. (wrongly printed A.F.A.!) for the sand, its clay-content range and the typical chemical composition of the three grades marketed. Some notes as to foundry usage are also included. It is pleasing to learn of the increasing attention which is being given by large supply houses to offering standardized sands to founders.

Grinding Machine. Beacon Machine Tools, Limited, Hurst Lane, Tipton, Staffs, in leaflet No. 38 illustrate and describe the "Superior" 16-in. high-speed double-ended dry grinder. It is manufactured under a licence granted by the British Cast Iron Research Association which covers an arrangement for dust extraction. Two features of the machine are the subject of Patents—the speed-adjustment mechanism and the motor drive. A full specification of the grinder is set out in the letterpress.

Exhausters and Boosters.—Publication No. 75, received from W. C. Holmes & Company, Limited, Turnbridge, Huddersfield, covers a line of Connersville exhausters and boosters. To a layman, such as the reviewer happens to be, they much resemble the Rootes blower which Dr. James McKenzie once insisted was the best means of providing a cupola with blast. It would seem from this publication that a major use for these boosters and exhausters is for gas works.

Protective Clothing. Jeltek, Limited, Green Lane, Hounslow, Middlesex, in a 12-page illustrated booklet well cover the subject of the supply of weather-resistant clothing made from P.V.C. having welded seams. Their speciality would appear to be garments carrying the name of using firms in large letters as a combination of publicity and insurance against loss.

Heat Exchangers. A four-page leaflet, which describes and illustrates a new type of heat-exchanger, has been issued by British Boiler Accessories, Limited, 62/3, Fenchurch Street, London, E.C.3. It is known as the B.B.A. "Helitube" and consists of narrow tubes tightly coiled into a helical shape and housed in an external jacket.

Centrifugal Fans. In Publication No. 177a, The Standard & Pochin Bros., Limited, Evington Valley Road, Leicester, describe a very wide range of PR "Uniform" pulley-mounted centrifugal fans. Over 25 sizes are detailed in performance tables, and another large table sets out the dimensions of all these sizes.

THE TRADERS' ROAD TRANSPORT ASSOCIATION, the national body for "C" licence operators, is preparing the details of a campaign which will be launched with the slogan "Kerb Space is Precious." The aim of the campaign is to cut down if possible the waiting time of commercial vehicles in busy thoroughfares, and it is to be inaugurated at a luncheon in London on October 20.

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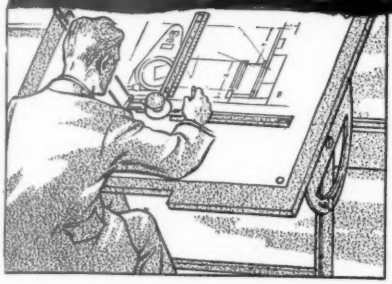

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Company News

Brush Group, Limited

Hitherto operating as a self-contained unit within the Hawker Siddeley Group, Limited, the board of the Brush Group, Limited, is to cease to be an executive body. Announcing the decision to integrate the activities of the Brush Group with those of the parent organization, Sir Roy Dobson, managing director of the Hawker Siddeley Group, said the change was inevitable as part of the rationalization programme. Brush Group factories would continue to operate and sell their own products under their own names.

All the directors of the Brush Group, with the exception of Sir Roy Dobson, Mr. J. F. Robertson, and Mr. P. C. Sharp, have resigned. Mr. G. C. R. Eley, former chairman of Brush Group, remains a director of Hawker Siddeley. Sir Harold Roxbee Cox is leaving the company, and Mr. Ian T. Morrow has ceased to be managing director and has left the service of the company. Mr. Maurice Tattersfield has also resigned his directorship and has accepted an outside appointment.

Sir George Briggs has been given full executive responsibility for the operations of the Brush diesel engine companies, Mirrlees, Bickerton & Day, Limited, the National Gas & Oil Engine Company, Limited, J. & H. McLaren, Limited, Petters, Limited, and Bryce Berger, Limited. Mr. Arthur H. Frampton, who is associated with A. V. Roe (Canada), Limited, in an industrial consultative capacity, has been temporarily appointed with full executive responsibility for the Brush electrical engineering companies.

Mr. D. S. A. E. Jessop (personnel director), Mr. C. F. Barnard (heavy engine division), Mr. Michael Clear (export sales), and Mr. J. Calderwood (technical director), although ceasing to be directors of the Brush Group, will continue to act in their respective capacities.

COLTNESS IRON COMPANY, LIMITED—An interim dividend of 4d. compares with a corresponding payment of 6d. a 6s. 8d. share.

CHURCHILL MACHINE TOOL COMPANY, LIMITED—The company is cutting the interim dividend from 10 per cent. to 7½ per cent. on its £1,055,040 ordinary capital in respect of 1958, and foreshadows a final of not less than 15 per cent., making 22½ per cent., compared with the 27½ per cent. paid for 1957, when the final was 17½ per cent.

SWITCHGEAR & COWANS, LIMITED—In order to bring the capital more into line with assets employed, the company proposes a one-for-one free issue. The present one-class capital in issue is £225,000. The directors are also raising the interim dividend from 7½ per cent. to 10 per cent. in respect of 1958. The total for 1957 was 22½ per cent.

BENNIS COMBUSTION, LIMITED—The company is not paying a final ordinary dividend for the year to April 30, 1958. An interim of 2½ per cent. was paid in January. The total for 1956-57 was 15 per cent. Group loss, after all charges, was £14,809 (profit of £23,024). UK tax amounted to £400 (£28,250). Last November an offer for the ordinary capital from Gwent & West of England Enterprises, Limited, was made unconditional in respect of all acceptances received.

MIDLAND INDUSTRIES, LIMITED, manufacturers of "MIL" steam fittings and agricultural implements, of Wolverhampton—A final dividend of 4½d. per share, making 7d. per share, of 58¼ per cent., is being paid for the year ended June 30, 1958, and a scrip issue of three-for-17 is announced. A similar rate was paid for the previous year, prior to a two-for-15 scrip issue. Group profits, before tax, fell from £130,230 to £128,246. Tax absorbs £70,900 (£77,224), leaving an increased net profit of £57,346 (£53,006).

DAVID BRIDGE & COMPANY, LIMITED, specialist engineers and ironfounders, of Rochdale (Lancs)—A one-for-one scrip issue, involving the capitalization of £198,000, which will be applied to increase the 5s. ordinary units to 10s. units, will be made to holders to-day. It is intended to recommend for the year to September 30, 1958, a final dividend of 9 per cent. on the increased capital, which, with the 5 per cent. interim already paid, would be equal to 23 per cent. on the present capital, compared with 22½ per cent. for the previous year.

AIRSCREW COMPANY & JICWOOD, LIMITED, propeller and ventilating fan manufacturers, etc., of Weybridge (Surrey)—British Match Corporation, Limited, has now fixed the terms of its latest bid for the remaining ordinary capital of the company. One ordinary £1 share for every seven ordinary 2s. units in Airscrew is offered. Robert Benson, Lonsdale & Company, which was consulted by the board, considers the offer to be fair and reasonable and the board strongly recommends its acceptance. The offer is subject to Treasury consent and will be made as soon as possible.

CHARLES ROBERTS & COMPANY, LIMITED, manufacturers of road and rail vehicles, wheels, axles, and springs, etc., of Horbury Junction, near Wakefield (Yorks)—The directors have decided not to make an offer in cash for the £200,000 preference capital of Hurst Nelson & Company, Limited, manufacturers of railway rolling stock and components, etc., of Motherwell, but to make an offer in alternative form in due course. Charles Roberts made an offer for the ordinary capital which in April became unconditional. Earlier this month the directors stated that an offer to acquire the preference for cash was under consideration.

WILLIAM JACKS & COMPANY, LIMITED, pig-iron and non-ferrous metal merchants, etc., of London, E.C.2—The chairman, Mr. W. Gray Buchanan, said at the recent annual meeting that, although there were many difficulties facing the company which might affect results of the second half of the current year, estimated profits for the first half compared favourably with those of the corresponding period of 1957. The year 1957 was the best since conversion into a public company with profits, before tax, amounting to £446,000 (£338,000). Turnover was well maintained at just under £14,500,000 and exports exceeded £6,000,000.

Mr. C. E. Rockwell, chairman of Rockwell Engineers, Limited, strongly recommends shareholders to accept the offer of five 10s. ordinary shares of the Coventry Gauge & Tool Company, Limited, for every four ordinary 5s. shares in Rockwell Engineers. The offer, made at the end of July, is subject to acceptance by October 3 of such lesser percentage or later date (up to October 17) as may be agreed. If the offer is successful, Mr. Rockwell will join the board of Coventry Gauge & Tool as a managing director, and Mr. J. Middleton will join the board. Sir Stanley Harley, who will remain as chairman of Coventry Gauge & Tool, will succeed Mr. Rockwell as chairman of Rockwell Engineers, and Mr. W. J. Foster will become a director of Rockwell Engineers. Mr. Rockwell points out that if Coventry Gauge & Tool does no more than maintain the 6¼ per cent., tax free, dividend rate of the past four years, holders of Rockwell Engineers are likely to have their income substantially increased.